Baltimore City Landscape Manual

Department of Planning - May 2017









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In early 2011, the Baltimore City Department of Planning assembled a committee of local professionals to provide review and feedback throughout the process of developing a landscape manual for the City of Baltimore.

The Department of Planning thanks following people for serving as part of the Baltimore City Landscape Manual Advisory Committee:

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INTRODUCTION

The recommendations of the 2006 Comprehensive Master Plan for the City of Baltimore included the creation and adoption of a City-wide Landscape Manual in addition to modernization of City Code Article 32 – "Zoning", hereafter referred to as "the Baltimore Zoning Code" or "the Zoning Code". The Landscape Manual has been developed in conjunction with and in support of the update of the Zoning Code and has been coordinated with the City of Baltimore and the State of Maryland Critical Areas, Forest Conservation, and Stormwater Management regulations.

Goals

This manual strives to support the goals of the City of Baltimore Comprehensive Master Plan, the Baltimore Zoning Code and the Baltimore Sustainability Plan through the regulation and provision of landscape elements in development and redevelopment projects in Baltimore. The Landscape Manual will support these documents by working to achieve the following goals, as established in Section 4-503 of the Baltimore Zoning Code:

- Improve and increase the city's *environmental quality and green infrastructure network.*
- Preserve and enhance the city's *character and sense of place.*
- Foster the *economic vitality* of the city's neighborhoods and commercial districts.
- Provide a clear process for the design, review, and approval of landscape plans within the City of Baltimore's development *review process*.
- Promote the long-term *health and maintenance* of the city's landscape and tree canopy.

Environmental Quality and Green Infrastructure Network

It is the policy of the City of Baltimore to maintain the purity of its air and water and to control detrimental impacts from pollutants upon public health, property, environmental resources, and climate. The city's green infrastructure network, which includes natural areas such as forests and streams, as well as constructed elements such as urban parks, street trees, and stormwater management practices, not only improves air and water quality but may also provide wildlife habitat, increased thermal comfort, and reductions in energy use. The landscaping requirements in this manual serve in part to support the goals established in the Baltimore Sustainability Plan, to preserve, improve, and increase the city's green infrastructure network and to provide a balance between its built and natural environments. The requirements established by the Landscape Manual will also support City initiatives to increase the urban tree canopy and reduce pollution from urban stormwater runoff.



Character and Sense of Place



The character of Baltimore's natural and built landscapes varies throughout the city. The Landscape Manual aims to include requirements that promote high quality landscape design yet provide flexibility to allow designs to meet the needs of the particular project site and fit the character of the existing neighborhood. The layout and landscaping of new developments shall incorporate design principles which will help retain the essential visual, spatial, and environmental qualities of the existing landscape. New development shall complement and enhance the unique character of existing neighborhoods and corridors. Development projects will provide appropriate landscape transitions between new and existing buildings, drives, and parking areas.

Landscape design must also be sensitive to public safety concerns and the perception of a comfortable and safe environment. Designs must allow surveillance of the private and public properties, open spaces, and roadways that make up neighborhoods. Design of planting and lighting play important roles in providing a secure neighborhood environment.

Economic Vitality

To be sustainable, development projects must not only provide environmental and social benefits, but also offer economic value. Landscape elements such as those required in the Landscape Manual offer a variety of economic benefits. Environmental attractiveness draws in investment and jobs and enhances the value of property. Healthy, mature trees in residential areas have been shown to increase property values by 10 to 20%[1,2] and increase the speed of home sales[3]. It has been shown that well-landscaped commercial districts encourage shoppers to spend more time and money and return more often[4]. Studies have shown that workers with access to green space are healthier and more productive[5].

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[1] Morales, D.J., B.N. Boyce, and R.J. Favretti. 1976. The Contribution of Trees to Residential Property Value: Manchester, Connecticut. *Valuation* 23, 2:26-43.

[2] Thériault M., Kestens Y. and Des Rosiers F., 2002. The impact of mature trees on house values and on residential location choices in Quebec City. In A.E. Rizzoli and A.J. Jakeman (eds.), Integrated Assessment and Decision Support. Proceedings of the 1st biennial meeting of the International Environmental Modeling and Software Society, University of Lugano, Switzerland, vol. 2, pp. 478-483.

[3] Hoff, Mary. Conserving Wooded Areas in Developing Communities. Minnesota Department of Natural Resources, 2002.

[4] Wolf, K.L. 2005. Business District Streetscapes, Trees and Consumer Response. *Journal of Forestry* 103 8:396-400.

[5] Kuo, F.E. (2004). Horticulture, well-being, and mental health: From intuitions to evidence. In Relf, D. (Ed.), "A proceedings of the XXVI International Horticulture Congress: Expanding roles for horticulture in improving human well-being and life quality." Acta Horticulturae, 639, 27-36.

Review Process

The Landscape Manual has been developed with the design, review, approval, and implementation of landscape plans in mind. The manual contains diagrams and plan examples to convey the intent of the regulations, while allowing designers and property owners the freedom to apply the requirements in ways that work with and complement the opportunities and constraints of their projects. The manual has been developed to coordinate with the city and state requirements for Critical Areas, Forest Conservation, and stormwater management planting requirements. The manual provides an overview of how the landscape plan relates to the Site Plan Review and permit processes and includes checklists of the elements required for plan approval. The detailed planting and soil standards included in the manual help to ensure that the landscape elements implemented will fulfill their intended function and life span.

Landscape Health and Maintenance

Proper landscape installation and maintenance is critical to the long-term health of plants and to ensure that the landscape continues to provide the environmental, esthetic, and economic benefits described above. The maintenance of landscaping also plays an important role in providing a safe and secure neighborhood environment, by maintaining visibility and access along pedestrian, vehicular, and bicycle circulation routes and facilitating natural surveillance of streets, open spaces, and properties.

Landscape Objectives and Elements

Landscape design is an essential element of site design. Basic design and planning principles to address image, circulation, environmental quality, and human comfort must be employed if the objectives are to be accomplished.

The objectives of the Landscape Manual, as established in the Baltimore City Zoning Code, are summarized as follows:

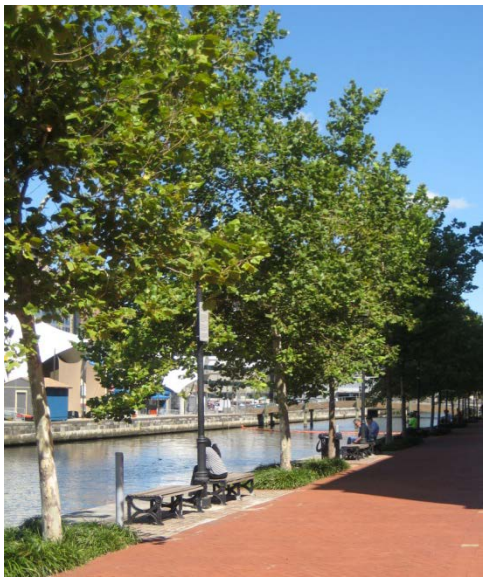
Environmental

- Foster environmentally sensitive site design that preserves natural vegetation and landforms.
- Complement the built environment through planting which:
  - Improves water quality and reduces stormwater run-off
  - Reduces soil erosion
  - Increases the city's tree canopy
  - Promotes biodiversity
  - Helps to mitigate the urban heat island effect

Character & Sense of Place

- Articulate spatial relationships, provide image, develop sense of place, and improve the aesthetics of the built environment.
- Enhance the quality of life of city residents through planting which provides comfortable outdoor spaces for people to occupy

- Create pedestrian and bicycle-friendly environments
- Provide visual screens and buffers to:
  - Diminish undesirable views
  - Reduce glare and noise
  - Mitigate the impacts of intensive uses



Economic

- Provide landscape design that is functional, cost effective, and sound.
- Create environments that are safe for residents and visitors and deterrents to potential criminals.

Review Process

- Integrate the preparation, review, and approval of landscape plans into the existing City process for development review and approval.
- Coordinate landscape requirements with related regulations, including those for Critical Areas, forest conservation, stormwater management, and green building standards.
- Allow flexibility and encourage creative solutions to meet the intents and standards of the Landscape Manual.

Landscape Installation and Maintenance

- Ensure that landscaping is installed and maintained in conformance with approved landscape plans.
- Ensure that landscaping is installed and maintained in a manner that will promote the proper health, function, and appearance of the landscape.
- Encourage the use of sustainable landscape construction and maintenance techniques, to support the goals established by the Baltimore Sustainability Plan.

Detailed objectives associated with specific project conditions are found under the section "Requirements for Project Site Conditions".

Various landscape elements may be used to accomplish the above objectives. A general listing of landscape elements is as follows:

- Topography and landforms
- Grading
- Planting
- Fences and walls
- Lighting
- Paths and sidewalks
- Site furniture
- Public art
- Water features

- Miscellaneous structures

Through creative and sensitive application of many coordinated landscape elements, the designer can create a mutually supportive combination of the built environment and landscape. A thorough understanding of the elements and their effective application will result in a positive addition to the city as well as a pleasant environment for residents and visitors.

APPLICABILITY, REVIEW, & ENFORCEMENT

Landscape Manual Administration

Consistent with and to implement the Baltimore City Zoning Code, the Landscape Manual defines the required landscaping and screening for development. Authority for administration of this manual, including the granting of waivers and the amending of landscape requirements shall be in accordance with Title 3 of the Zoning Code.

This Landscape Manual may be periodically reviewed and updated by the Planning Director as required to bring the manual into conformance with current legislation and practice, subject to review and approval by the Planning Commission. Minor corrections to address typographical errors, updates to various citations or references, links to online resources, and corresponding corrections to the Table of Contents shall be considered minor in nature and authority to make such corrections is assigned to the Director of Planning.

Applicability

All development or redevelopment projects that involve 5,000 square feet or more of site disturbance and require Site Plan Review Committee approval, including such projects undertaken by the City of Baltimore, are subject to the requirements of the Landscape Manual. These requirements are binding on all subsequent property owners. Single-family detached and semi-detached dwellings are exempt from the requirements of the Landscape Manual. Building renovations or façade improvements that do not involve 5,000 square feet or more of site disturbance are also exempt from the requirements of the Landscape Manual.

Overlapping Regulations

The Critical Area Management Program, Forest Conservation Program, Stormwater Management Regulations, neighborhood plans, urban revitalization plans (URPs), or streetscape guidelines of the State of Maryland or the City of Baltimore have provisions that are directly related to the provision of landscape plantings required for development projects. The requirements of all applicable programs or regulations must be met. It is the responsibility of the property owner or its agent to determine if a project site is subject to any such programs, plans, or regulations. Where landscape requirements differ from those of the Landscape Manual, the more stringent requirements will apply. Appendix I includes further information and resources to help property owners and plan preparers determine which overlapping regulations, plans, and guidelines apply to their project.

All projects on lands within 1,000 feet of tidal waters are regulated by the Critical Area Management Program. Development projects which disturb 20,000 square feet or more of land, or subdivide a lot of 20,000 square feet or more are regulated by the Forest Conservation Program. Projects which entail construction, grading, or development that will disturb in excess of 5,000 square feet of land area are also subject to stormwater management requirements.

Landscaping provided to satisfy the intents and requirements of the overlapping regulations identified above may also be used to fulfill Landscape Manual requirements, provided that the landscaping satisfies one or more of the Requirements for Project Site Conditions identified in the Landscape Manual and meets the standards contained in the Landscape Manual. For

example, landscaping provided as part of a stormwater bioretention area within a parking lot island may satisfy stormwater management planting requirements while also counting towards parking lot interior landscaping required in the Landscape Manual under Condition G: Parking Lots. As another example, landscaping provided as part of a green roof constructed to meet stormwater management requirements may not satisfy any Landscape Manual requirements because landscaping on a green roof does not satisfy the intents of the Project Site Conditions defined in the Landscape Manual.

The conservation requirements of the Critical Area Management Program and Forest Conservation Program, and some of the plantings required as part of the afforestation requirements under these programs may be credited towards the requirements of the Landscape Manual. Plantings provided as part of stormwater best management practices (BMPs) that meet the requirements of the Maryland Stormwater Design Manual and Baltimore City Stormwater Design Guidelines may also be credited as part of the requirements for the Landscape Manual, as described under Condition B: Stormwater Management Facilities. The Landscape Manual encourages the use of these practices and techniques.

The following table summarizes the criteria for the regulations described above and identifies which landscaping requirements or credits may be applied towards the requirements of the Landscape Manual. In all cases, where landscape requirements differ from those of the Landscape Manual, the more stringent requirements will apply.

Program or Regulation	Conditions for Applicability	May Fulfill LM Requirement(s)	May Not Fulfill LM Requirement(s)
Critical Area Management Program	Projects on lands within 1,000 feet of Tidal Waters	• Buffer mitigation plantings • Afforestation plantings • Mitigation for forest or vegetation removal	• Landscaping that does not satisfy Project Site Conditions
Forest Conservation Program	Projects which involve disturbance or subdivision of 20,000 square feet or greater	• Afforestation plantings	• Reforestation plantings • Landscaping that does not satisfy Project Site Conditions
Maryland Stormwater Design Manual/ Baltimore City Stormwater Design Guidelines	Construction, grading, or development that will disturb in excess of 5,000 square feet of land area	• Landscaping associated with site-based BMPs such as bioretention swales or rain gardens	• Landscaping that does not satisfy Project Site Conditions

The City of Baltimore Standard Specifications 2006, otherwise known as The Green Book, contains standard specifications for the design and construction of projects undertaken on City property and within public right-of-ways. Where landscape specifications contained in The Green Book differ from or are more stringent than the requirements contained in the Landscape Manual, the Green Book standards shall apply. Projects undertaken on private property are not required to adhere to the specifications contained in The Green Book.

Preparation of Landscape Plans

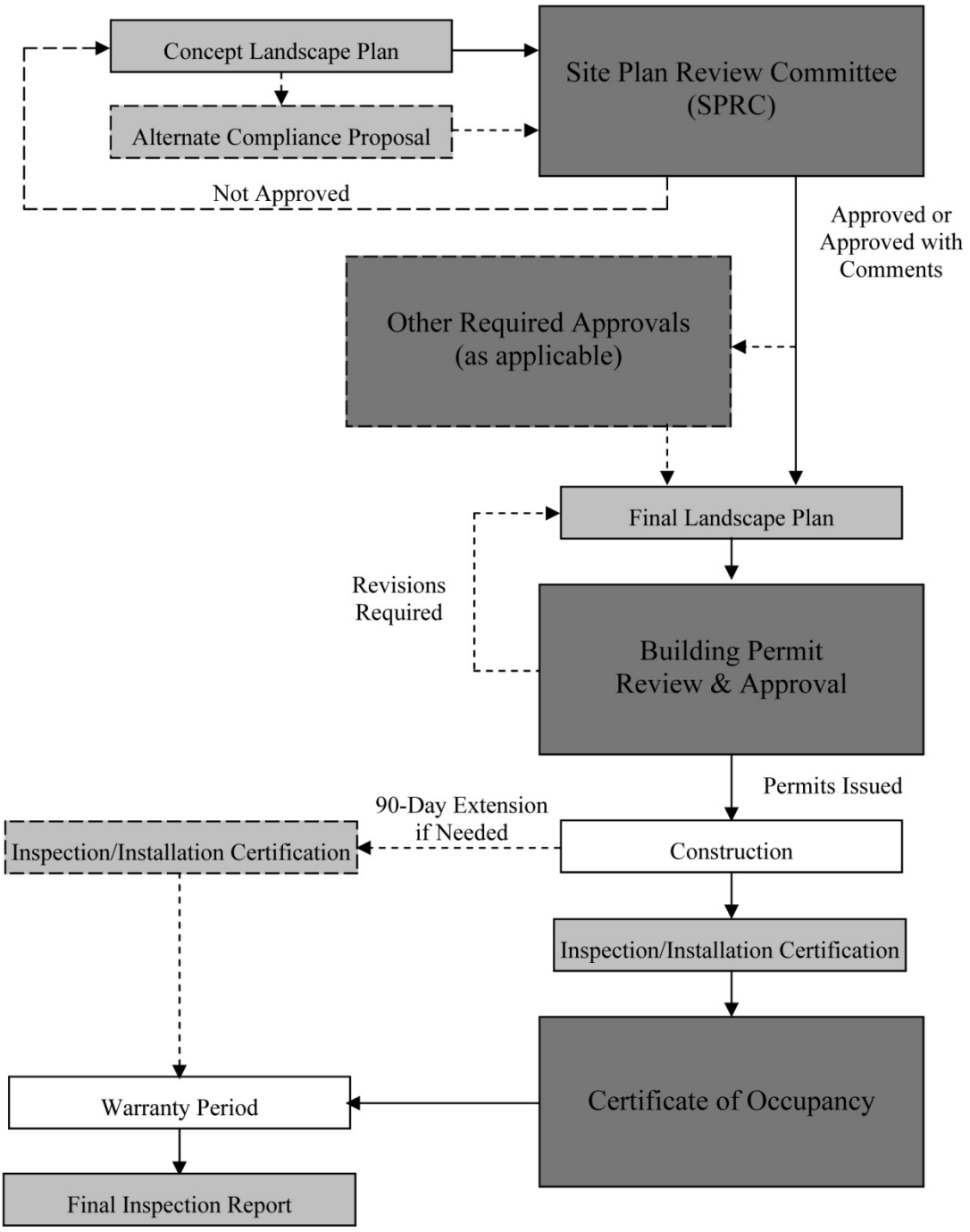
All Concept Landscape Plans and Final Landscape Plans for projects involving an area of disturbance of 20,000 square feet or more must be prepared by a landscape architect registered in the State of Maryland. Landscape plans for projects involving an area of disturbance of less than 20,000 square feet may be prepared by a landscape architect or a qualified landscape designer with a degree in landscape architecture, horticulture, or forestry with at least 3 years of experience or a landscape designer with 6 years of experience.

Development Review & Permit Process

Landscape plan submissions are required for all such projects described in the Applicability section of this manual. The Department of Planning will approve all landscape plans as part of the SPRC and building permit approval processes. Review of landscape plans is subject to a two-part submission and review process.

A Concept Landscape Plan is required as part of the submittal requirements to the SPRC. The Concept Landscape Plan must include the items contained in the Concept Landscape Plan checklist found in Appendix B. These requirements include the calculation of all required planting units and the indication of the locations where required landscaping and screening will be provided. If the project requires alternative compliance to satisfy the requirements of the landscape manual, proposals for alternative compliance must be submitted as described below. A Concept Landscape Plan will be approved, approved with conditions, or not approved. If a landscape plan is not approved or is approved with conditions, specific recommendations to bring the landscape plan into conformance with the Landscape Manual will be presented to the applicant as comments from the SPRC. Where measures for alternative compliance are agreed upon as part of the SPRC approval, these measures will be noted as conditions for SPRC approval. Appeals of Site Plan Review decisions may be made as described in the Zoning Code.

Landscape Plan Review Process



A Final Landscape Plan is required as part of a building permit application for all such projects described in the Applicability section of this manual. The Final Landscape Plan must include the items contained in the Final Landscape Plan checklist found in Appendix B. These requirements include the calculation of all required planting units, the locations of all planting and screening, a plant list, and planting details, including descriptions of proposed soil amendments. The

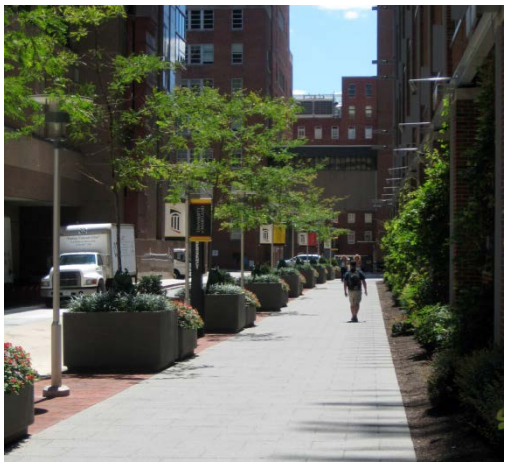
locations and details of any alternative compliance measures agreed upon as part of the SPRC approval must be shown.

An approved Concept Landscape Plan or Final Landscape Plan may be amended in accordance with the provisions of the Zoning Code requirements for amendment of the plans or permits under which the landscape plan was originally approved. Plantings in addition to those required by the Landscape Manual may be installed without requiring a revision to the approved plans, provided that the plant species are not listed as prohibited species in Appendix D.

Plant species substitutions may be requested by the plan preparer and approved by the Department of Planning provided that the substituted species meet the Landscape Manual requirements for size and ability to fulfill the intent of the regulations and the species are not listed as prohibited species in Appendix D. Requests for substitutions are to be made in writing. The request must clearly indicate the reasons for the substitutions. If acceptable with the reviewer, the request will be approved. If the species requested is not approved, the reviewer may provide alternate species for substitution or the applicant may respond with a revised substitution request.

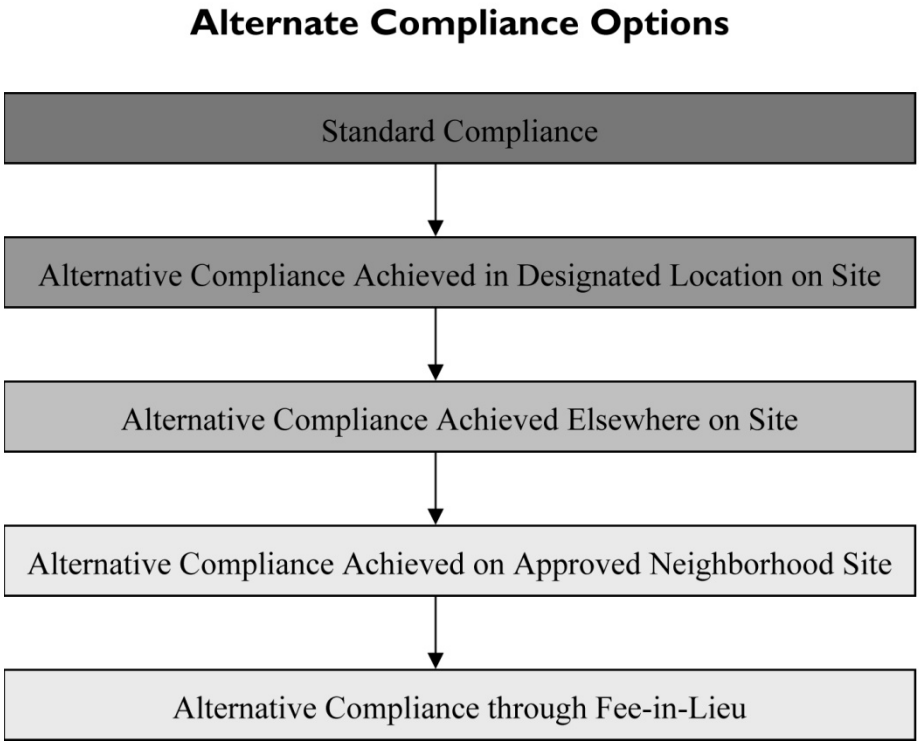
Alternative Compliance

The Landscape Manual is intended to set minimum standards for high quality development, the protection of property values, and environmental protection. The requirements are not intended to be arbitrary or inhibit creative solutions. Difficult or unique site conditions or other constraints may justify the need to request alternative methods of compliance with the landscape requirements. Requests for alternative compliance must be included as part of the Concept Landscape Plan. Requests must be accompanied by sufficient explanation and justification, in written and/or graphic form, to allow appropriate evaluation and decision.



The Department of Planning may allow alternative compliance if it is warranted and the proposed compliance measures are equal to or better than normal compliance in terms of quality, effectiveness, durability, hardiness, ecological benefit, and ability to fulfill the intent of the regulation. The Department of Planning encourages the use of creative and sustainable designs, materials, techniques, concepts, and technologies, for both standard compliance measures and as part of alternative compliance proposals. Proposals must demonstrate a clear commitment to and standards for the proper installation and long-term maintenance of designs or elements involving emerging technologies, techniques, or materials, to ensure their ability to function as intended into the future. The Department of Planning will consider alternative compliance proposals in the context of each specific site. Alternative compliance will be limited to the specific project under consideration and will not establish precedent for acceptance in other cases.

The following flow chart demonstrates the standards that will be applied in the consideration of alternative compliance proposals.



It is preferred that alternative compliance be achieved in the location within the project site specified by the intent and standards of the manual. Where the requirements cannot be satisfied in the intended location, the method of alternative compliance may be achieved elsewhere within the project site. Where alternative compliance cannot be achieved within the project site, alternative compliance may be achieved on an alternate site within the neighborhood, approved by the Department of Planning as well as any other necessary City agencies. A fee-in-lieu will only be accepted as a form of alternative compliance if none of the above options for alternative compliance can be achieved.

The base rate for the fee-in-lieu shall be $600 per planting unit (PU), or as determined by the Planning Commission and approved by the Board of Estimates. The rate is to be based upon the amount necessary to produce public benefits equal to normal compliance as described above, including the planting, establishment, and maintenance of equivalent landscaping. To determine the total required fee, the fee-in-lieu base rate shall be multiplied by the number of planting units required by the landscape manual that are determined to be infeasible to be fulfilled on site or on an alternate site. The payment of the fee-in-lieu must be made before a construction permits can be issued.

The City shall establish a special fund for the deposit of all sums paid in lieu of landscaping. All sums received shall be committed by the City to be dedicated to the installation and maintenance of landscaping that satisfies one or more of the Project Site Conditions defined in the Landscape

Manual. In no case shall the funds be used for routine maintenance of existing landscaping, or other facility maintenance. The fees shall be spent within the same watershed as the project for which such fees are paid, be visible to the general public, and be in conformance with the regulations set forth in this manual.

Enforcement

In accordance with the approved Building Permit, the owner will provide and install the elements shown on the approved Final Landscape Plan. Landscaping and screening shown on the approved Final Landscape Plan must be installed before the issue of an Occupancy Permit. If this cannot be accomplished due to seasonal planting requirements or construction time frames, the applicant may request a 90 day extension of the installation requirement.

All elements required by the Landscape Manual must be inspected by the plan preparer within 30 days of installation. The plan preparer must submit written Landscape Installation Inspection certification to the Department of Planning stating that healthy plant materials were properly installed in accordance with the locations, quantities, minimum sizes, and species indicated on the approved Final Landscape Plan. The submission must include the certification for the Landscape Installation Inspection located in Appendix H.

Installed plants are subject to a one-year replacement warranty to ensure establishment and maintenance of the landscaping and the replacement of dead or damaged plants. A final inspection shall be performed by the plan preparer within 30 days before the expiration of the warranty. Any plants that are found to be damaged, dead, or dying are to be replaced under the conditions of the warranty before submission of the final inspection report. A final inspection report, including the certification for the Final Landscape Inspection located in Appendix H, must be submitted indicating the fulfillment of the requirements of the landscape plan and establishment and survival of the plants.

In accordance with Section 2-201 of the Zoning Code, failure to comply with the provisions of the Landscape Manual is a violation of the Zoning Code. Failure to install required landscaping or submit inspection reports in a timely manner as required by the conditions above will constitute a violation of the Zoning Code. Should the installed landscaping at any time violate the approved plan, fail to comply with any requirements of this Landscape Manual, or should any portion of the landscaping be of failing health, it will constitute a violation of the Zoning Code. Corrections or replacement will be required, and failure to comply may result in fines or penalties in accordance with the provisions for the enforcement of the Zoning Code.

Maintenance Requirements

The owner of any property on which landscaping has been installed must maintain the landscaping in good condition and in accordance with all provisions of this Landscape Manual for the life of the project. In accordance with Section 2-201 of the Zoning Code, failure to maintain landscaping constitutes a violation of the Zoning Code. See Appendix G for specific maintenance requirements.

PLANTING REQUIREMENTS AND STANDARDS

Planting Units

Minimum required plant quantities are based on planting units. The use of planting units allows more creative planting design options and encourages the use of a greater variety of plant types. Combinations of different types of planting units are encouraged, such as the use of a combination of shade trees with shrubs to screen and define spaces. All plants provided must be equal to or better than the requirements of the "American Standard for Nursery Stock," latest edition, as published by the American Nursery and Landscape Association (ANLA)

One planting unit (PU) is equivalent to:

- One major deciduous tree 2½ inches or greater in caliper at installation, or
- Two minor deciduous trees 1¼ inches or greater in caliper at installation, or
- Two evergreen trees 6 feet or greater in height at installation or three evergreen trees 5 feet or greater in height at installation, or
- Six shrubs 18 to 36 inches in height at installation depending on screen type, or
- Five hundred square feet of groundcover planted at recommended ANLA standards, or
- Ten herbaceous/perennial plants at 1 gallon size, or
- Twenty herbaceous/perennial plants at 1 quart size.

The distinction between major and minor deciduous trees is based upon height at maturity. Major deciduous trees, more commonly known as shade trees, are those trees with a mature height of 30 feet or greater. Minor deciduous trees, more commonly known as ornamental or understory trees, are those trees with a mature height generally less than 30 feet, but greater than 15 feet.

The total number of planting units required will be based upon the proposed site conditions for the project, as defined in the "Requirements for Project Site Conditions" section of the manual. The number of planting units required for the project and the number of planting units provided on the plan must be tabulated as part of the landscape plan submission. When calculating required planting units, the plan preparer may round planting unit calculations to the nearest whole number, or represent fractions of required planting units as decimals, however the method of calculation must be consistent throughout the submission. Planting unit requirements such as 1 PU per 20 linear feet are given for the purpose of quantity calculation, and are not requirements for plant spacing.

Species Selection, Biodiversity, and Principles of Sustainability

Native species contribute to local ecology, provide habitat and food sources for wildlife, and help to maintain local ecosystems. Native plant species from the regional environment may be adapted to local conditions. In anticipation of the impacts of climate change to weather patterns and temperatures, it may be necessary to consider species native to more southerly portions of the eastern United States, in addition to those native to the Chesapeake Bay region.

In accordance with the goals of the City's Sustainability Plan and the Division of Forestry, the use of plant species native to the eastern United States is encouraged. All landscape plans are encouraged to include as many native species as possible, with a recommended goal of a minimum of 50% native species in planting designs. Native plant guides for the local region are available through the US Fish and Wildlife Service Bayscapes program or the University of Maryland Extension.

However, severe site conditions in urban environments may dictate the selection of some well-adapted, hardy, non-native or naturalized species, provided they are not invasive. The use of species that are tolerant of urban conditions and resistant to disease and pests is encouraged. See Appendix D for lists of recommended plant species.

Non-native species may introduce pests to the local environment and may out-compete native species, becoming invasive in natural settings and altering natural ecosystems. The use of invasive species is prohibited and the removal of existing invasive species is encouraged. Invasive species guides are available through the Mid-Atlantic Invasive Plant Council or the Maryland Invasive Species Council. See Appendix D for lists of prohibited plant species.

It is desirable for landscapes to incorporate species diversity to minimize potentially wide-spread impacts from pests, diseases, and other environmental or climatic factors. Plan preparers are encouraged to incorporate a variety of vegetative layers and plant species to provide ecological complexity. The Department of Planning may require projects to incorporate greater species diversity if planting designs appear to create monocultures of large numbers of plants representing relatively few species.

In addition to biodiversity, many other principles of sustainability can be incorporated into the design, construction, function, and maintenance of landscaped spaces. Several sustainable principles, such as minimizing impervious surfaces, encouraging the capture and filtration of stormwater runoff, and increasing the tree canopy have been included in the creation of the Landscape Manual standards.

The City of Baltimore and the Office of Sustainability encourage development and redevelopment projects to contribute to the achievement of the goals established by The Baltimore Sustainability Plan. Unique project objectives and site conditions may allow landscape design to address additional principles of sustainability. Appendix J: Sustainable Landscape Resources lists a number of sustainable landscape techniques, technologies, materials, and practices, along with links to resources for more information about each.

Planting Standards

Plants require specific planting conditions and maintenance to ensure proper establishment and maximize their health and life span. The design of proposed plantings should minimize the need for herbicides, fertilizers, or pesticides at any time before, during, and after construction and on a long-term basis. Additionally, plantings should be designed to minimize the need for mowing, pruning, and irrigation.

Minimum required standards for planting, soils, maintenance, and irrigation are included in the manual. Planting standards can be found in Appendix E. Standards for soil volumes and amendments are found in Appendix F. Appendix G contains the requirements for the maintenance and irrigation of landscape areas. All landscape plans submitted must meet or exceed these standards. Projects on City property or within City right-of-way shall conform to the tree protection and planting standards contained in The Green Book, in addition to meeting the requirements of this manual. These requirements shall be addressed through notes and details included as part of the Final Landscape Plan submission.

Screening



For some sites, screening is necessary to diminish the impact of undesirable views and mitigate the visual conflict and other effects of adjacent dissimilar land uses. Screening is required for storage and loading areas, service lanes, parking lots, certain categories of industrial uses, industrial uses adjacent to residential zones, and other conditions listed in this manual.

The degree of intensity of adjacent land uses and width of landscape strip available as a buffer will dictate the height, density, opacity, and landscape elements required. Specific requirements for screening can be found within the standards for each project site condition. Design guidelines for screening and fencing may be found in Appendix C. Screening may be waived in whole or part by the Department of Planning, provided that existing adequate and perpetual screening on an adjacent property is demonstrated as part of the landscape plan submission.

Crime Prevention Through Environmental Design

Landscape design must be sensitive to public safety concerns. Crime Prevention Through Environmental Design (CPTED) focuses on creating environments that are safe for residents and visitors and deterrents to potential criminals. CPTED also underscores the importance of maintaining and keeping landscaped areas free of litter, as a signal that residents and property owners have a vested interest in the area and will not tolerate illegal activities.

Through its design and landscaping principles, CPTED facilitates natural surveillance and natural access control of the private and public properties, open spaces, and roadways that make up neighborhoods and deters criminals from using these areas for illegal activities. Whenever possible, CPTED recommends avoiding the use of landscaping and screening elements that create blind spots or hiding places. This can be achieved by ensuring that shade trees have a minimum clear height of 8 feet and that all plantings, walls, and fences are carefully selected and sited, especially in proximity to major site accesses and other points of entry. Selecting plants that will naturally reach their maximum desired height or form without additional pruning can help to reduce the need for landscape maintenance to maintain safety and visibility. The use of plants with dense branching patterns or thorns can help to create natural barriers, obstruct potential hiding places, and direct site access to improve natural surveillance. Lighting design

shall be integrated with landscape design to maintain visibility and minimize the creation of shadows.

Where there is a need to balance concerns for safety with the screening of undesirable views, screening heights may be limited to the minimum height necessary. For cases where site design alone is not sufficient to provide adequate visibility and security, reductions in the required screening height, density of landscape planting, or opacity of screening elements such as walls and fences may be approved by the Department of Planning as part of an alternative compliance option.

REQUIREMENTS FOR PROJECT SITE CONDITIONS

This section has been designed to assist the plan preparer and the reviewer to determine that the goals and objectives of the Landscape Manual are being met by the combination of landscape elements chosen and their use on the site. In this section, a series of guidelines and standards address specific project conditions, providing flexibility in the design solutions utilized to meet the objectives of the manual.

Photographs and generic site plan examples have been included with many of the project site conditions, to demonstrate how landscaping and other elements could be used to address the requirements. These plans and photographs are intended to demonstrate the intent and the standards for the various project site conditions. The use of innovative techniques, materials, and technologies to create design solutions that meet the goals and needs of the proposed project as well as the goals and requirements of the Landscape Manual are encouraged.

Project conditions that generate landscape requirements may be existing or created; on-site or on adjacent property. These project conditions relate to site use and its impact on public and private land. The guidelines and standards are intended to ensure that the proposed project conditions provide positive contributions to environmental quality, neighborhood character and economic vitality.





CONDITION A: Preservation of Existing Trees

Intent

It is the policy of the City of Baltimore that there must be no net loss of trees or tree canopy within the City's boundaries. To satisfy Title 4, Subtitle 3 of the Zoning Code (Environmentally Sensitive Areas Review) and the intent of this condition, the project must use a coordinated combination of site design, grading, and construction techniques to achieve the following:

- Satisfy the requirements of the Critical Area Management Program and Forest Conservation Program, where applicable.
- For project sites not regulated by the above programs, preserve existing trees and tree canopy to the maximum extent practicable.
- For project sites not regulated by the above programs, preserve or mitigate the removal of Protected Trees as required. Protected Trees include:
    - Street Trees and Public Trees (per Article 7, Division 5 of the City Code)
    - Trees within properties or rights-of-way designated as Baltimore City Landmarks by City ordinance
    - Specimen Trees - 20 inches DBH or greater
    - Significant Trees - 12 inches DBH or greater for major/canopy trees and 8 inches DBH or greater for understory/minor trees located within required setbacks and within 10 feet of a public property or right-of-way

Standards

In satisfying the intent of this condition, landscape designs must comply with the following standards:

Preservation of Existing Trees -

1. The preservation of existing trees on lands within 1,000 feet of tidal waters is regulated by the Critical Area Management Program. The preservation of existing trees within project sites which involve 20,000 square feet or more of disturbance, or which subdivide a lot of 20,000 square feet or more is regulated by the Forest Conservation Program. All requirements of these programs must be met where applicable.
2. All healthy Protected Trees must be preserved to the greatest extent practicable. The standards for tree preservation found in Appendix E must be applied in the design and construction of the areas of the site containing or adjacent to existing trees to be preserved.



3. No Protected Tree may be removed until the Final Landscape Plan has been approved, including approval of replacement mitigation and/or required fee-in-lieu. This requirement may be waived only for trees deemed hazardous and presenting an imminent danger as documented by a certified arborist.

Replacement Mitigation & Afforestation-

1. Replacement mitigation for Protected Trees determined to be in fair or better condition by a certified arborist is one caliper inch (DBH) of replacement for each caliper inch (DBH) removed.
2. No mitigation is required for the removal of a Protected Tree if:
   - The tree is infested or diseased to the extent that death is imminent or the tree is a threat by contagion.
   - The tree is deemed a hazard by a certified arborist, and is removed with approval of the Department of Planning for trees on development sites or Division of Forestry for Street Trees and Public Trees.

   The exempting conditions must be documented in the existing conditions plan or as part of a separate tree survey.
3. Major deciduous trees and minor deciduous trees proposed on the site for the purpose of satisfying the **mitigation requirements** of Condition A of the Landscape Manual may be applied towards the planting units required by Conditions B through P of the Landscape Manual under the following conditions:
   - Trees must be in a location and of a nature that they contribute to the objectives and intent of the Landscape Manual.
   - Locations of trees must help to satisfy the standards for one or more of the site conditions that generate planting requirements as part of the Landscape Manual.
   - Where potential exists to use proposed trees to improve the edges of natural areas, create or strengthen connections to existing natural areas or open spaces, or increase the ecological potential of the site landscape, tree location and species selection shall aim to address this potential.
   - Caliper inches required for mitigation may be satisfied on a 1 to 1 ratio based upon caliper inch at installation, up to 4 inches of mitigation credit per proposed tree.
     Example 1: 2 major deciduous trees at 2 ½ inches DBH count as 5 caliper inches of mitigation.
     Example 2: 1 major deciduous tree at 3 inches DBH and 1 minor deciduous tree at 2 inches DBH count as 5 caliper inches of mitigation.
4. Major deciduous trees proposed on the site for the purpose of satisfying the **afforestation requirements** of the Critical Area Management or Forest Conservation programs may be applied towards the number of planting units required by Conditions B through P of the Landscape Manual under the following conditions:
   - Trees must be in a location and of a nature that they contribute to the objectives and intent of the Landscape Manual.
   - Locations of trees must help to satisfy the standards for one or more of the site conditions that generate planting requirements as part of the Landscape Manual.
   - Where potential exists to use proposed trees to improve the edges of natural areas, create or strengthen connections to existing natural areas or open spaces, or increase

the ecological potential of the site landscape, tree location and species selection shall aim to address this potential.

- A credit of one planting unit may be given for each major deciduous shade tree 2½ inches or greater in caliper at installation

5. If mitigation planting requirements cannot be met on-site, mitigation plantings may be located off-site, within the same watershed as the project site, as approved by the Department of Planning. Mitigation plantings for public trees must be located on public property.
6. If on-site or off-site mitigation is not feasible to satisfy the total mitigation requirement, the balance of required mitigation may be made as a fee-in-lieu payment. The rate for the fee-in-lieu shall be $250 per caliper inch DBH. The fee-in-lieu amount will be evaluated and adjusted periodically as determined by the Planning Commission and approved by the Board of Estimates.

Plan Submissions -

1. The extent of existing trees/forest and any other environmentally sensitive areas on the site shall be shown on the existing conditions plan, in accordance with Section 4-304 of the Zoning Code. All Protected Trees, as defined above, must be identified on the existing conditions plan with the species, size, and health shown and special conditions noted.
2. A tree protection plan must be included in the Final Landscape Plan submission and Sediment and Erosion Control plan. Details and notes describing the method of protection for existing trees to be preserved must be included. Details and notes should be in accordance with the standards for tree preservation found in Appendix E.



3. Total required afforestation or replacement mitigation required must be tabulated as part of the Final Landscape Plan submission. Total afforestation or replacement mitigation shown as part of the Final Landscape Plan and any replacement mitigation to be satisfied off-site or through fee-in-lieu must be indicated in these tabulations. Sample tabulations are included in Appendix B. In order to receive credit for afforestation or mitigation provided on site, such trees shall be shown on the Final Landscape Plan and included in the proposed plant list and planting unit tabulations.

CONDITION B: Stormwater Management Facilities

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:



- Integrate stormwater management water quality facilities, and stormwater management water quantity facilities if applicable, into the landscape environment.
- Utilize plants including trees, shrubs, perennials, and groundcovers to blend stormwater BMPs with surrounding landscape areas, soften harsh embankments, and integrate new landforms into the landscape.
- Incorporate native plant species that contribute to wildlife habitat and water quality attributes of stormwater management systems.
- Screen objectionable views of stormwater management structures where appropriate.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. All existing and proposed stormwater BMPs shall be shown and identified on the landscape plan.
2. The design of stormwater management BMPs, including landscaping, shall meet the standards of the Maryland Stormwater Design Manual, Volumes I & II, the Baltimore City Stormwater Management Design Guidelines, and the Critical Area 10% Rule Guidance Manual where applicable. The design of stormwater management BMPs located within the right-of-way must also meet any other standards required by the Baltimore City Department of Public Works and Department of Transportation. Review of landscape designs for BMPs will be based upon the guidelines presented in Appendix A - Landscaping Guidance for Stormwater BMPs found in the Maryland Stormwater Design Manual.
3. To encourage the integration of stormwater BMPs into the landscape, planting units provided to satisfy the requirements of the Maryland Stormwater Design Manual may also be credited towards the planting unit requirements for other project conditions, providing that the intent and standards of all applicable regulations are met. Project conditions for which BMP planting units may be credited include the following:
   - Condition D – Open Spaces & Plazas
   - Condition E – Waterfront Promenade
   - Condition F – Street Frontage and Streetscape
   - Condition G – Parking Lots

- Condition I – Automotive Display Areas
- Condition J – Automotive Uses
- Condition K – Service Lanes and Drive Through Lanes
- Condition L – Storage and Loading Areas
- Condition N –Telecommunications Facilities
- Condition O – Industrial Uses
- Condition P – Historic Structures and Landscapes

4. The use of Environmental Site Design (ESD) principles and practices is encouraged.
5. Stormwater BMP design, grading, and landscaping shall be combined in a way that integrates the facilities into the landscape and minimizes objectionable views of these facilities and any associated structures. This is especially critical where BMPs are located along a public street or near the public entrances to a building.
6. Where potential exists to use stormwater BMP landscaping to improve the edges of natural areas, create or strengthen connections to existing natural areas or open spaces, or increase the ecological potential of the site landscape, planting design and species selection shall aim to address this potential.
7. Landscape plans requesting credit for BMP landscaping towards planting units required by the Landscape Manual shall submit one of the following:
   - Show the BMP planting units on the landscape plan and include them in the plant list and tabulations. Clearly state as part of the tabulations how many planting units provided as part of BMP landscaping are requested for credit towards Landscape Manual requirements.
   - Include the landscape plans submitted as part of the Stormwater Management design review as part of the submittal of the landscape plan. Clearly state as part of the landscape plan tabulations how many planting units provided as part of BMP landscaping are requested for credit towards Landscape Manual requirements. Include these planting units in the tabulations required as part of the landscape plan submission.
8. Fencing of BMPs may be required on a case-by-case basis at the discretion of the Surface Water Management Division of the Department of Public Works. If provided, fences shall be of a character compatible with the project or surrounding neighborhood, and constructed from durable materials.

CONDITION C: Existing and Proposed Slopes

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of site grading and landscape elements to achieve the following:

- Prevent erosion through the stabilization of soil on existing and newly created slopes.
- Incorporate distinctive existing topographic features into the site design.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. The protection of existing slopes shall comply with the requirements set forth in the Baltimore City Zoning Code for Environmentally Sensitive Areas Review under Title 4, Section 3. In accordance with Section 4-304 of the Zoning Code, existing steep slopes of 20% or more must be documented on the Existing Conditions Plan.
2. Existing slopes disturbed by construction activity shall be replanted to stabilize the soil and prevent erosion. A list of recommended native plants for slope stabilization can be found in Appendix D.
3. Proposed slopes 2:1 or greater, exceeding 5 feet in height from toe to top of slope, and proposed slopes 3:1 or greater, exceeding 10 feet in height generate required plantings at a rate of **1 PU per 20 linear feet** measured at the toe of the slope.
4. An additional **1 PU per 20 linear feet** is generated for each 20 feet in height beyond the first 5 feet in height for proposed 2:1 slopes, and for each 30 feet in height beyond the first 10 feet in height for proposed 3:1 slopes.
5. Planting shall include a mixture of plant types, which may include perennials, shrubs, evergreen trees, and deciduous trees. The layering of plants of various types and heights to aid erosion control and increase the ecological complexity of the landscape is encouraged. Trees may not be planted on proposed slopes steeper than 3:1. A list of recommended native plants for slope stabilization can be found in Appendix D.

CONDITION D: Open Spaces & Plazas

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of design features to achieve the following:

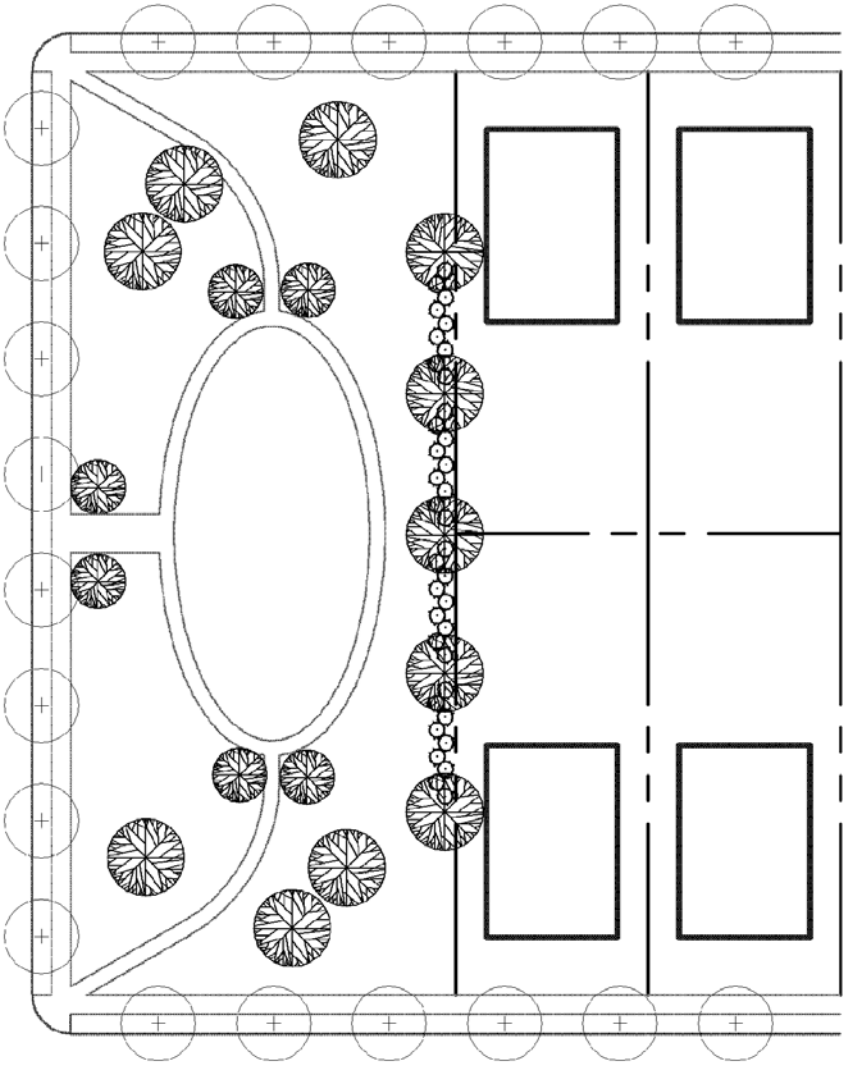


- Enhance the visual quality and sense of place within the neighborhood or development.
- Provide defined edges to the space to distinguish common spaces from other adjacent uses.
- Provide visibility and pedestrian access into the space from streets and parking areas to maintain a sense of security and encourage use.
- Enhance the comfort of the space through the use of landscape treatments and site amenities.
- Promote stormwater infiltration through the minimization of impervious surfaces and the integration of stormwater management into landscaped areas where possible.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Landscaping shall be provided to complement the function of the open space. Open spaces, including those developed as plazas, patios, or other hardscaped spaces, are required to provide planting units at a rate of **1 PU per 1200 square feet** of open space provided. Open space areas used for active recreation such as athletic fields, areas of open water, areas devoted to community-managed open space or urban agriculture, and areas where existing vegetation has been preserved may be subtracted from the open space area for which landscaping is required.
2. Plazas located within a C-5 commercial district are required to be constructed with 25% of the area landscaped. This landscaped area may include, but must not be entirely comprised of, semi-pervious surface.
3. The selection and placement of plants shall satisfy the requirements of any existing community and revitalization plans applicable to the site.
4. Planting shall include a mixture of plant types, which may include perennials, shrubs, evergreen trees, and deciduous trees.
5. Where potential exists to use proposed plantings to improve the edges of natural areas or increase the ecological potential of the site landscape, landscape design and species selection shall aim to address this potential.
6. The landscape requirements for all other applicable site conditions apply (Condition F - Street Frontage and Streetscape, Condition G - Parking Lots, etc.).
7. The retention of existing vegetation is encouraged. See Condition A - Preservation of Existing Trees.
8. This manual encourages the use of landscape areas within open spaces and plazas to accommodate stormwater BMP facilities. Proposed plants in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intent and standards of this section.



Planting Legend

Planting Unit not for this site condition

Major deciduous tree

Minor deciduous tree

Shrubs

Condition D Sample Plan: Required Open Space Planting
Scale: 1" = 50'

Site Condition	Rate	Distance/Area	Required Planting
Open Space	1 PU/1200 Sq. Ft.	24,000 Sq. Ft.	20 PU

CONDITION E: Waterfront Promenade

Intent

The waterfront promenade refers to the minimum 12-foot wide paved pedestrian promenade and associated public access easement required by the Zoning Code for waterfront lots under the W-1 Overlay Subdistrict. These areas also fall within the Critical Area and are subject to the requirements of the Critical Area Management Program.

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of design features such as plants, planting beds, raised planters, and grade changes to achieve the following:

- Enhance the visual quality and sense of place along the waterfront promenade.
- Establish human scale, provide shade, and improve the comfort of these spaces for pedestrians.
- Provide defined edges and separation between the waterfront promenade and outdoor extensions of adjacent retail uses.
- Integrate onsite stormwater management into landscaping where appropriate.
- Maintain an open, inviting, secure environment for pedestrians.

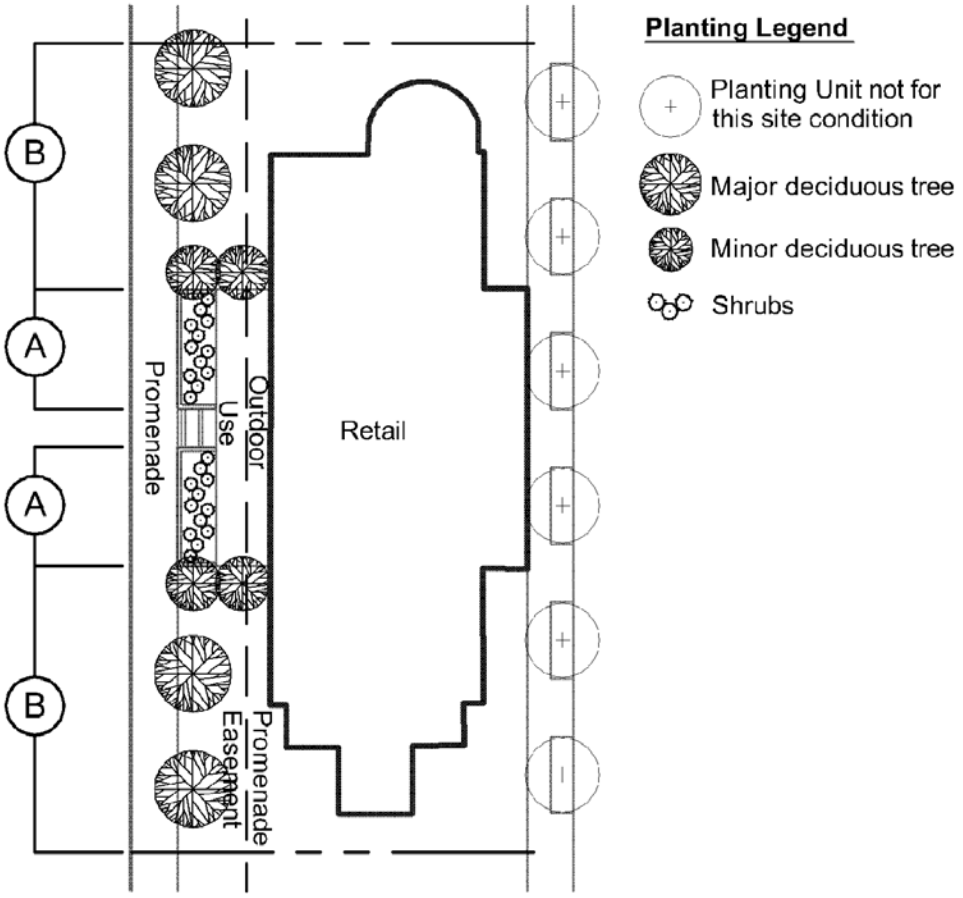


Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Where outdoor extensions of retail uses are located adjacent to the promenade or within the promenade easement, the following standards apply:
   - The outdoor uses shall be physically separated from the paved portion of the promenade through the use of planting beds, raised planters, or a minimum 2-foot vertical separation.
   - Planting beds or raised planters provided generate plant quantities at a rate of **1 PU per 15 linear feet**, measured along the length of the promenade easement. Planting may include a mixture of plant types, including groundcover, perennials, shrubs, evergreen trees, and deciduous trees.
2. Along all other portions of the waterfront promenade easement, areas within the easement not containing permanently paved promenade surface generate plant quantities at a rate of **1 PU per 25 linear feet** measured along the length of the promenade easement. Plantings may include a mixture of plant types, including perennials, shrubs, evergreen trees, and deciduous trees.
3. Plantings may be provided through the use of planting beds, tree pits, or raised planters.
4. Plantings may define edges and provide separation but shall not obscure views of the waterfront from adjacent uses or along designated view corridors.

5. The selection and placement of landscape elements shall be consistent with the standards established by any approved community plans and revitalization plans to which the site is subject. Where landscape requirements differ from those of the Landscape Manual, the more stringent requirements shall be applied.
6. This manual encourages the use of landscape areas required along the waterfront promenade to accommodate stormwater BMP facilities. Proposed plants in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.



Condition E Sample Plan: Required Promenade Easement Planting
Scale: 1" = 50'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Outdoor Retail Use	1 PU/ 15 LF	60 LF	4 PU
B	Promenade Easement	1 PU/ 25 LF	140 LF	6 PU

CONDITION F: Street Frontage and Streetscape

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of design features such as plantings, architectural elements, site furnishings, signage, and lighting to achieve the following:

- Delineate vehicular and pedestrian circulation patterns to improve the comfort and safety of pedestrians and bicyclists.
- Establish human scale, provide shade, and offer visual relief from expansive road and parking surfaces.
- Incorporate community image and identity through the coordination of streetscape design with established patterns or community plans, or establish project or neighborhood identity in areas with no existing pattern or approved plan.
- Where appropriate, provide visual interest and enhance way-finding by using landscape elements to accent entrances, intersections, gateways, or corridors.
- Integrate onsite stormwater management into landscaping where appropriate.



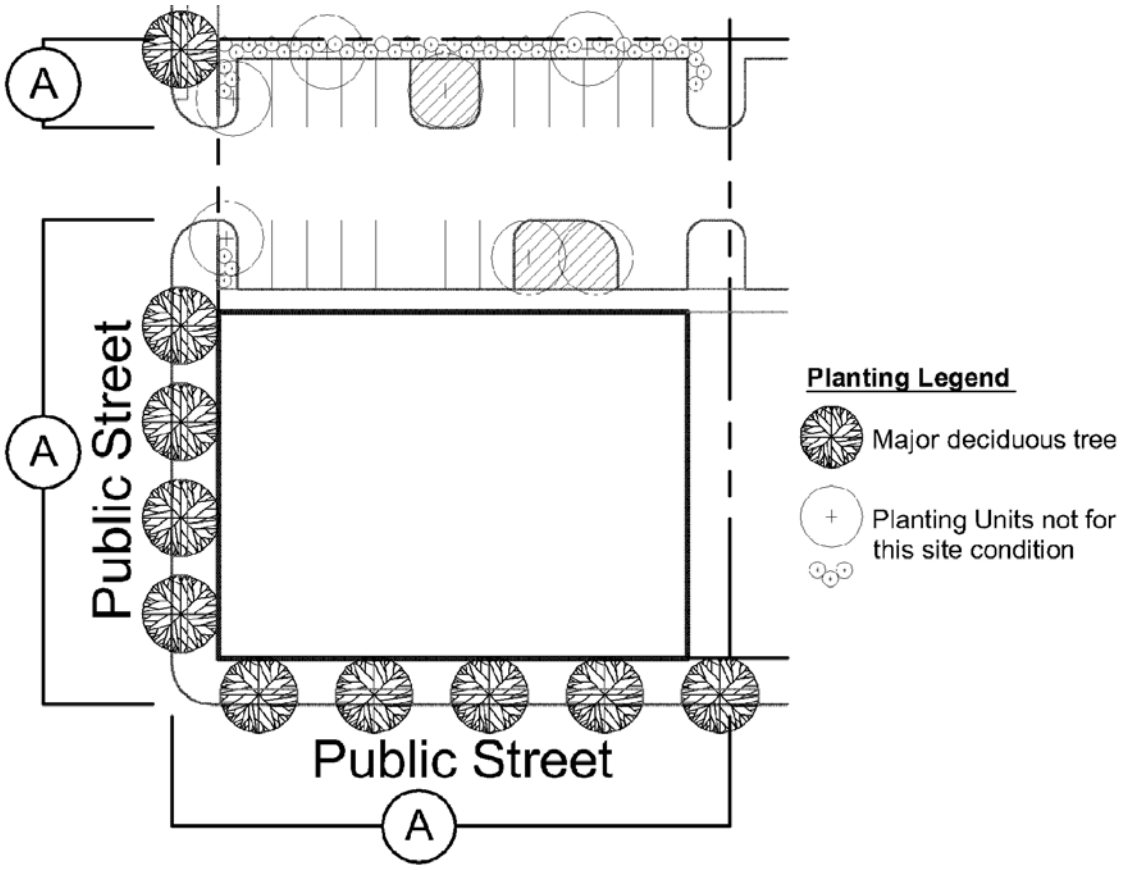
Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Provide a minimum of **1 PU per 30 feet** of public or private street frontage, excluding driveways and alleys. This requirement may be reduced by 1 PU for each existing street tree in good condition to be retained within the right-of-way.
2. Plantings within the public right-of-way shall comply with Baltimore City Green Book standards.
3. The locations and spacing of street trees shall comply with Baltimore City Department of Transportation standards.
4. The design of streetscapes and the selection and placement of landscape elements shall be consistent with the standards established by any approved community plans and revitalization plans to which the site is subject or with established patterns within the neighborhood. Where landscape requirements differ from those of the Landscape Manual, the more stringent requirements shall be applied.
5. To satisfy the intent of this condition, planting units shall be provided in the form of major deciduous trees to the maximum extent practicable.
6. The selection and placement of landscape elements and plants shall be coordinated with the locations of all existing and proposed utilities, including overhead wires. In cases where the presence of utilities precludes the use of major deciduous trees, other plant types including minor deciduous trees, shrubs, perennials, and groundcovers may be used

to satisfy the planting unit requirements for this condition, pending Department of Planning review and approval. Selection of minor deciduous trees shall be made from the recommended trees "Suitable below Power Lines" listed in Appendix D. The use of alternate plant types such as minor deciduous trees or shrubs may not interfere with visibility into public sites such as parks or vehicular, bicycle, and pedestrian circulation along streets and sidewalks.

7. The provision of plants within the right-of-way shall not impede pedestrian movement along the sidewalk or hinder sight distances or the visibility of traffic control signs.
8. All tree pits and planting strips shall comply with the standards described in Appendix E and the soil standards described in Appendix F.
9. This manual encourages the use of tree pits, planting strips, and bump-outs to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.



Condition F Sample Plan: Required Street Tree Planting
Scale: 1" = 50'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Street Frontage	1 PU/30 LF	294 LF	10 PU

CONDITION G: Parking Lots

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:

- Provide shade and visual relief to paved areas and help to mitigate the urban heat island effect.
- Screen parking lots from adjacent public rights-of-way and other uses, while maintaining safety.
- Mitigate the impacts of lighting and noise while enhancing the privacy of adjacent residential properties.
- Delineate vehicular and pedestrian circulation through the provision of landscaped islands, peninsulas, or other planting areas.
- Integrate parking areas into the city's existing fabric and integrate parking lot screening into the streetscape design where appropriate.
- Integrate onsite stormwater management into landscaping where possible.



Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

General standards for parking lot landscape areas:

1. All landscape areas shall be protected by curbs, wheel-stops, bollards, or other vehicular control devices. The selection and location of landscape materials shall account for vehicle bumper overhang and the swing of vehicle doors adjacent to parking bays.
2. All ground surfaces within planting areas that are not planted with trees or shrubs must be planted with perennials, groundcover, lawn, or covered with mulch or pervious paving.
3. Plant type and placement shall not hinder sight distances, visibility, or perceptions of safety.
4. This manual encourages the use of parking lot perimeter and interior planting areas to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.
5. The minimization of impervious surfaces and the use of pervious paving materials are encouraged.

Perimeter landscape screening shall be provided as follows:

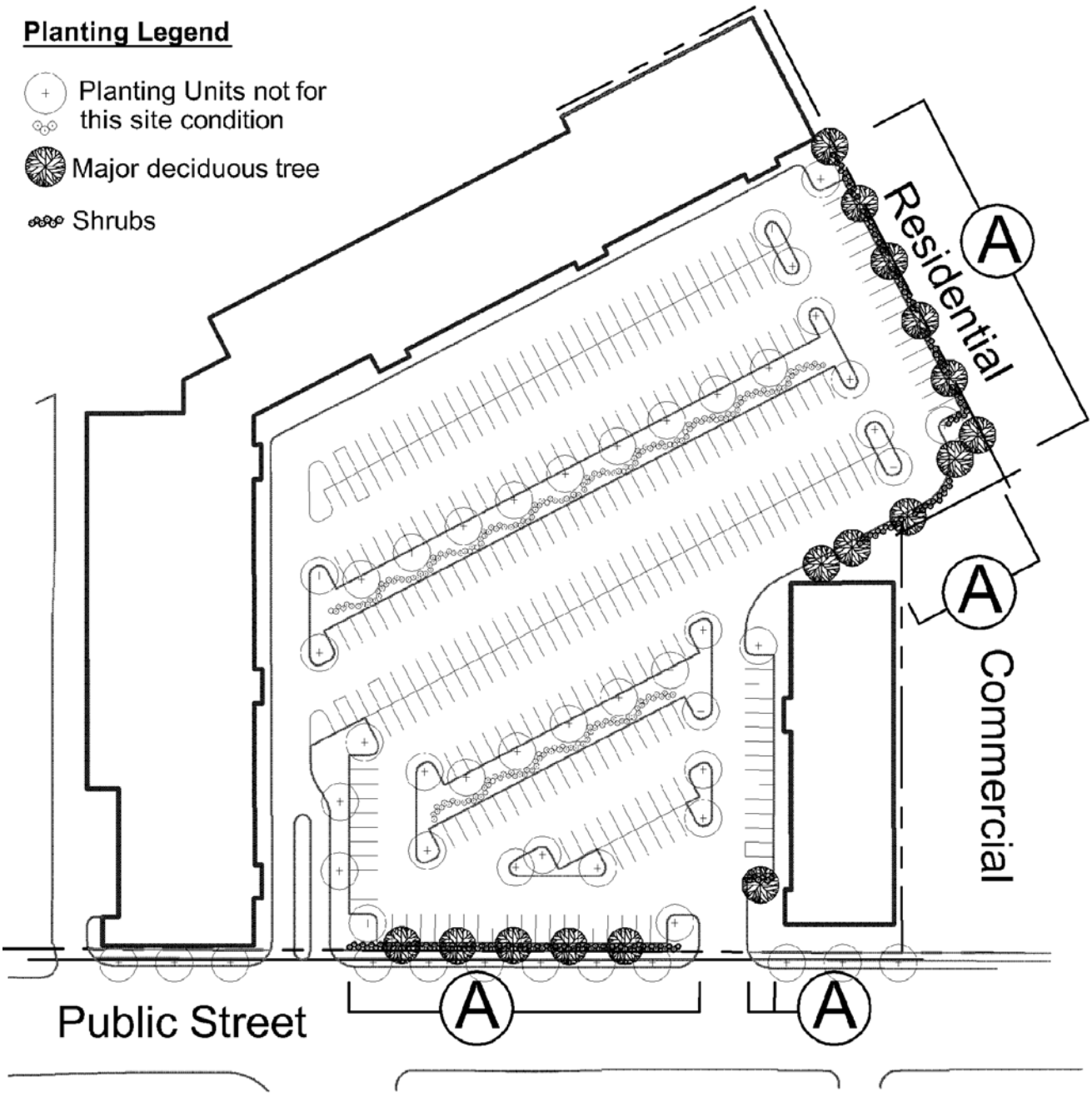
1. The perimeter landscape strip must be at least 7 feet in width, as measured from the lot line to the back of curb or edge of pavement. Where wheel stops are provided to prevent car bumpers from extending into the landscape strip, the width of the landscape strip may be reduced to 5 feet. Where the minimum landscape strip width is not feasible, a reduction in width may be granted if a wall three feet in height or other method of

alternative compliance is proposed. Where parking lots are interconnected across shared property lines, a perimeter landscape strip is not required.

2. Where the minimum landscape strip width is not feasible, a reduction in width may be granted if a wall three feet in height or other method of alternative compliance is proposed. If walls or fences are located within the landscape strip, required plants shall be placed between the wall or fence and the sidewalk when located along the right-of-way. Along a property line, the wall or fence shall be located along the property line with the plants placed on the inside of the wall.
3. Plant requirements will be calculated and provided as follows:
    - **1 PU per 35 linear feet** of parking perimeter, to be provided in the form of major deciduous trees. In areas where overhead utilities exist, this requirement may be satisfied through the provision of minor deciduous trees, calculated at the same rate. Along right-of-ways, trees may be grouped or staggered to minimize conflicts with street trees and other streetscape elements. In cases where a reduction in landscape strip width is granted as described above, the required perimeter landscape trees shall be provided elsewhere within the parking lot or project site if the reduced width is inadequate for tree planting.
    - **1 PU per 20 linear feet** of parking perimeter, to be provided in the form of shrubs measuring a minimum of 24 inches at planting and a height of 30 to 42 inches at maturity. Shrubs must be spaced to adequately screen parking lots and vehicle bumpers.

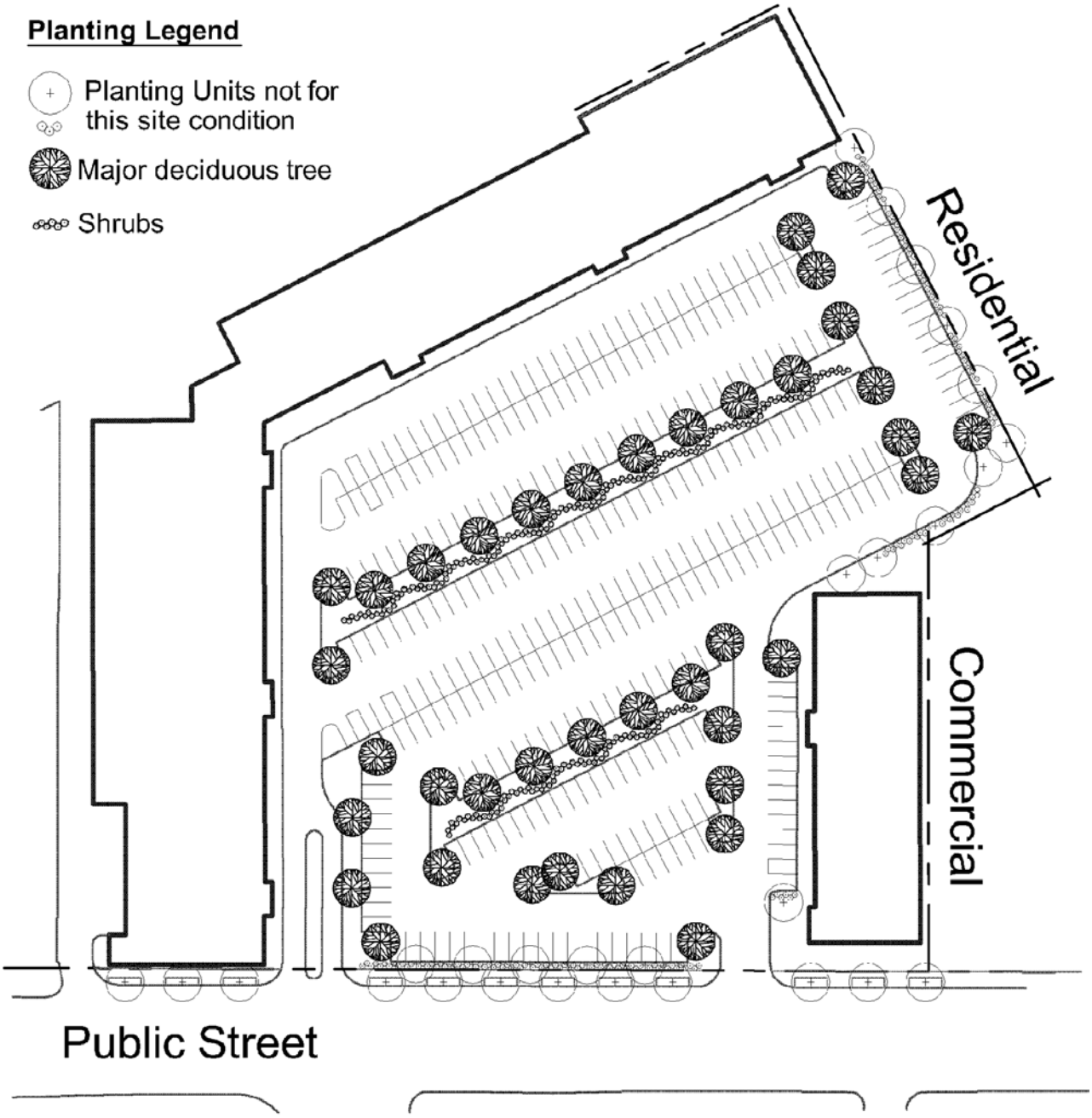
Interior landscaping shall be provided as follows:

1. Reserve **10% of the parking lot interior** for landscape planting areas. The parking lot interior shall be measured as the area bounded by the parking lot perimeter curb or edge. For parking lots utilizing pervious paving materials, pervious paving areas may be subtracted from the total parking lot area from which required planting areas are calculated. Parking lots containing 15 or fewer spaces or containing less than 5000 square feet of impervious area are exempt from providing interior landscaping, however perimeter landscaping is required.
2. Required planting areas may be consolidated into larger islands to provide greater soil volumes for plants or to accommodate stormwater BMPs; however it is encouraged that landscape islands be evenly distributed throughout a parking lot. All rows of parking spaces must be terminated by a parking lot island or landscaped area, unless handicap parking is provided at the end of the row.
3. The minimum area of parking lot medians or islands shall be 360 square feet, and the minimum width shall be 9 feet from face of curb to face of curb.
4. Plant requirements shall be calculated and provided as follows: Provide **1 PU per 200 square feet** of required interior planting area, with at least 50% of PUs provided in the form of major deciduous trees.
5. Pedestrian paths made of permeable materials are encouraged where landscaped areas are of a size or shape that is likely to interfere with pedestrian passage.



Condition G Sample Plan: Required Parking Lot Perimeter Planting
Scale: 1" = 100'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Parking Perimeter - Trees	1 PU/ 35 LF	545 LF	16 PU
A	Parking Perimeter - Shrubs	1 PU/ 20 LF	545 LF	27 PU



Condition G Sample Plan: Required Parking Lot Interior Planting
Scale: 1" = 100'

Site Condition	Rate	Distance/Area	Required Planting
Planting Area	10% of total	146,000 Sq. Ft.	14,600 Sq. Ft.
Interior Planting	1 PU/ 200 Sq. Ft.	14,600 Sq. Ft.	73 PU

CONDITION H: Parking Structures

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:

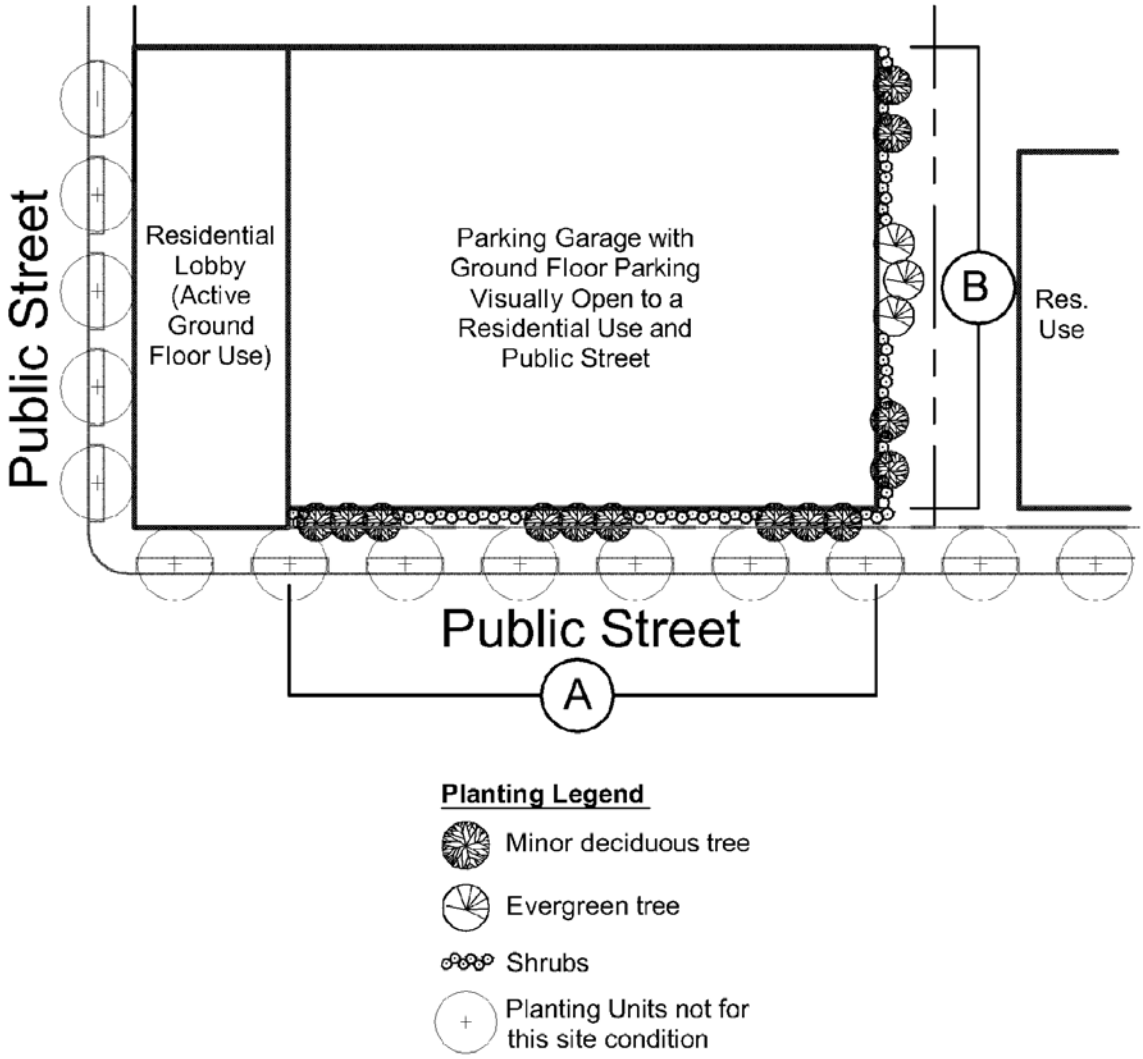
- Screen views of parked cars where the ground floor of a parking structure is occupied by vehicle storage.
- Alleviate views of monotonous building masses.



Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standard:

1. Where parking occupies the ground floor of a parking structure and is visually open to an adjacent residential use or public right-of-way, excluding alleys, provide screening as follows:
   - Provide planting units at a rate of **1 PU per 15 linear feet** of the area to be screened.
   - Planting area for required screening must be a minimum of 5 feet wide.
   - Plantings may include a combination of major deciduous trees, minor deciduous trees, evergreen trees, and shrubs.
   - Shrubs must be a minimum of 18 inches in height at the time of installation, and must provide a minimum three foot height year-round visual screen at maturity.
2. Screening is not required for parking structures that include active ground level uses or incorporate architectural treatments to conceal views of parked cars at the ground level.



Condition H Sample Plan: Required Parking Structure Planting
Scale: 1" = 50'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Parking Structure Open to ROW	1 PU/ 15 LF	153 LF	10 PU
B	Parking Structure Open to Residential	1 PU/ 15 LF	120 LF	8 PU

CONDITION I: Outdoor Sales and Display

Intent

This condition applies to outdoor sales and display areas including, but not limited to, motor vehicle dealerships and rental establishments. To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:

- Provide attractive display areas that complement the business and streetscape.
- Delineate vehicular and pedestrian circulation and maintain public right-of-ways and sidewalks clear of parked vehicles.
- Provide visual relief from expansive parking areas, and screen views of storage lots.
- Integrate architectural elements such as signage within the landscape area.
- Integrate onsite stormwater management into landscaping where appropriate.
- Provide shade and help to mitigate the urban heat island effect.

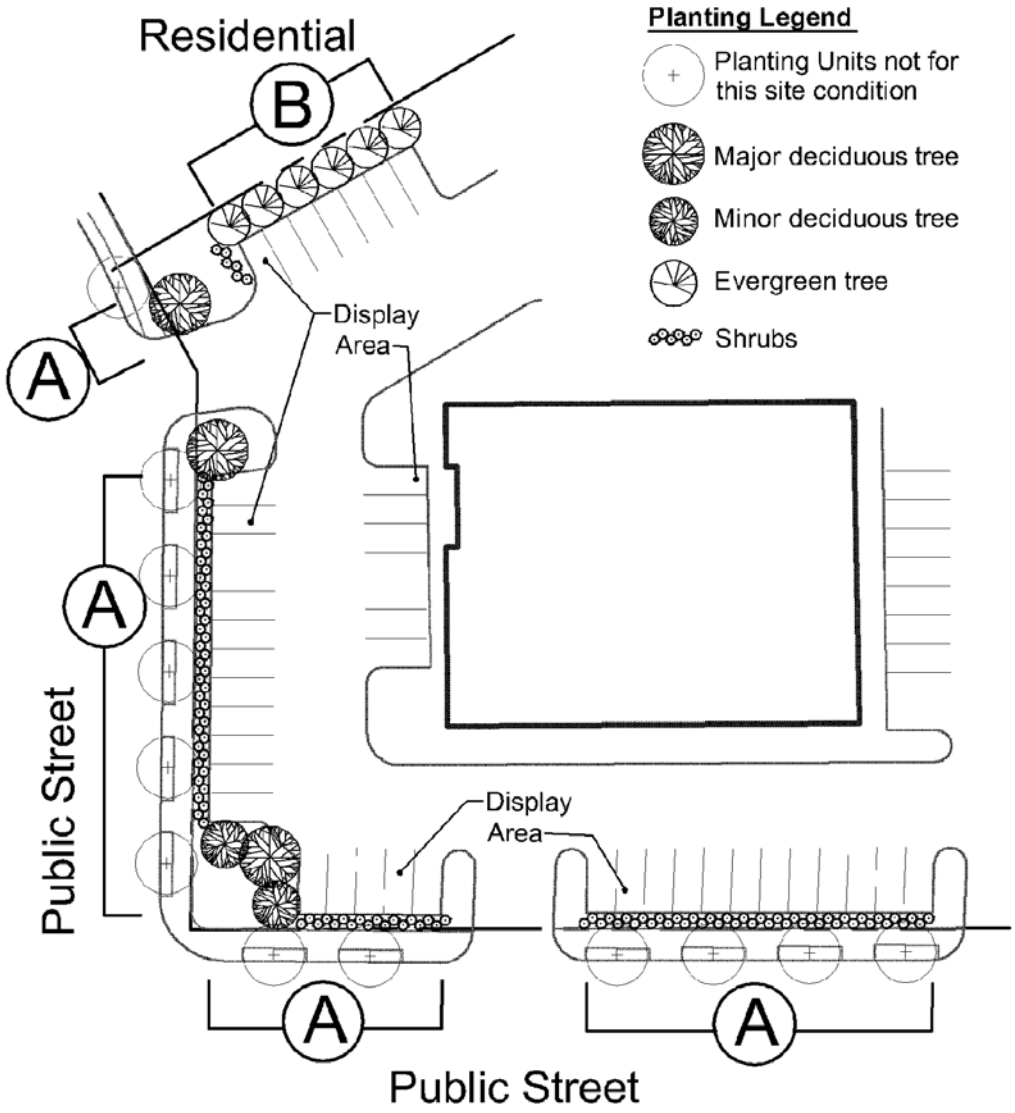


Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Motor vehicles shall not be displayed or placed within landscape areas or public right-of-way.
2. All landscape areas adjacent to vehicular circulation or parking areas must be protected by curbs, wheel-stops, bollards, or other vehicular control devices.
3. Motor vehicle display areas shall follow the setbacks for parking lots and are subject to the interior landscaping criteria for parking lots.
4. Adjacent to public right-of-way, excluding alleys, outdoor sales and display areas shall be landscaped in accordance with the following requirements.
    - A landscape strip of at least 7 feet in width, as measured from the right-of-way to the back of curb or edge of pavement shall be provided. Where wheel stops are provided to prevent car bumpers from extending into the landscape strip, the width of the landscape strip may be reduced to 5 feet.
    - Provide planting units generated at a rate of **1 PU per 15 linear** feet of display area adjacent to the right-of-way.
    - Plantings must be a minimum of 18 inches in height at the time of installation, and reach a minimum mature height of 24 inches, measured from the top of curb of the adjacent road.
    - A combination of plantings with a low pedestrian wall of no less than three feet in height may also satisfy the screening requirement.

5. Adjacent to residential properties, outdoor sales and display areas must be screened by an opaque masonry wall, a solid wood or simulated wood screen fence, or a landscape strip. Landscape strips must meet the following requirements:
   - Evergreen trees or shrubs of at least 6 feet in height at maturity must be provided at a rate of **1 PU per 20 linear feet** of display area.
   - Planting strips must be of a width sufficient to accommodate mature plants without encroaching onto adjacent property or extending into display areas.
6. Areas dedicated to customer parking, employee parking, and storage are subject to the following:
   - Customer parking – Condition G – Parking Lots
   - Employee parking – Condition G – Parking Lots
   - Storage – Condition L – Storage and Loading Areas
7. This manual encourages the use of landscape areas required for outdoor sales and display areas to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.



Condition I Sample Plan: Required Automotive Display Area Planting
Scale: 1" = 60'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Right-of-Way	1 PU/ 15 LF	336 LF	22 PU
B	Residential	1 PU/ 20 LF	65 LF	3 PU

CONDITION J: Automotive Uses - Gas Stations, Car Washes, Service, and Repair

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:

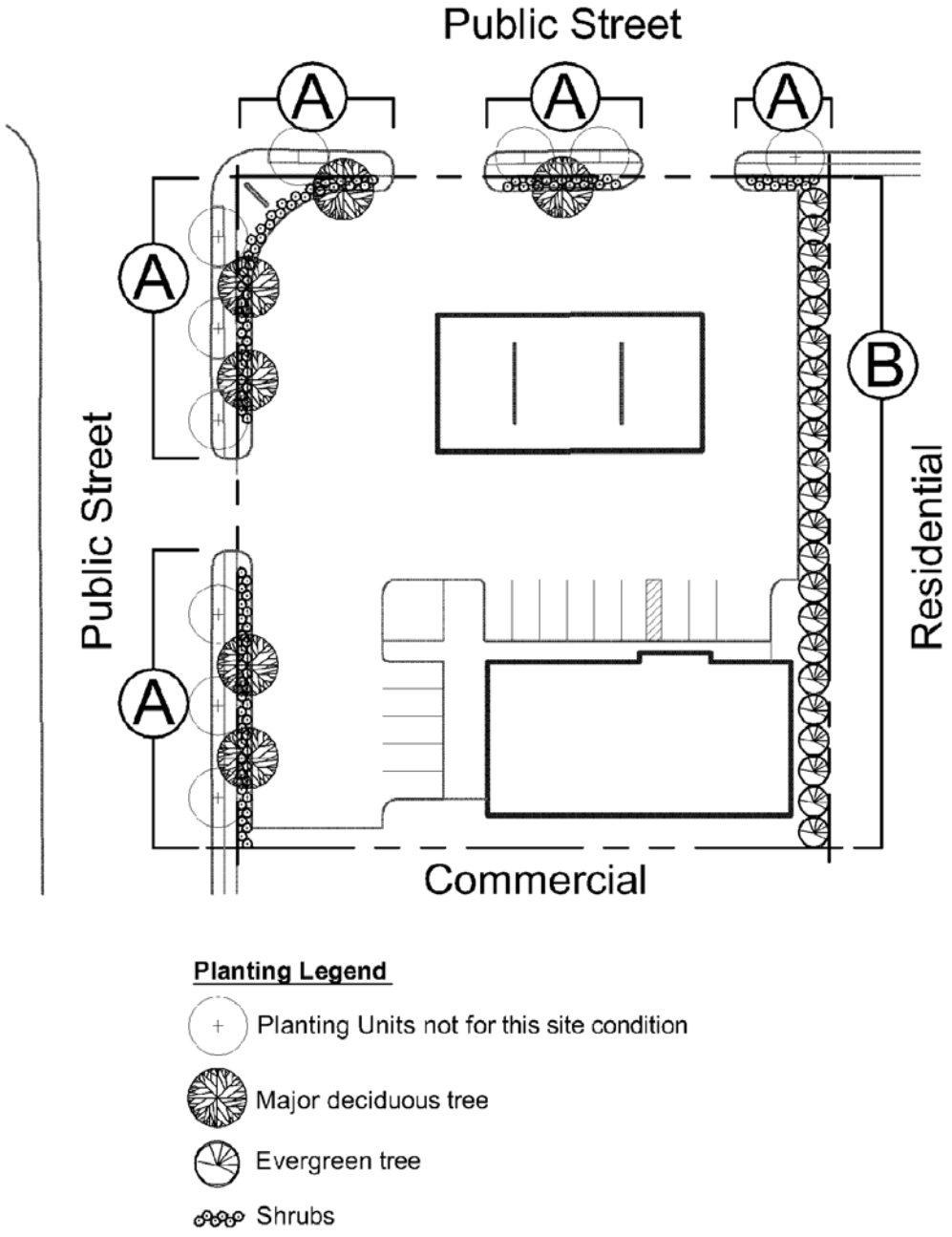


- Provide shade and visual relief of large paved areas.
- Present a landscaped area that is compatible with and enhances adjacent residential areas, industrial areas, or commercial corridors
- Mitigate impacts of lighting and screen undesirable views from residential areas and other adjacent uses.
- Incorporate site signage into the landscape design and coordinate landscaping with city sign regulations.
- Integrate onsite stormwater management into landscaping where appropriate.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. When a fuel service station, car wash, or automotive service and repair use abuts a public or private street, the landscape area shall be provided as follows:
   - A landscape strip of at least 5 feet in width, as measured from the right-of-way to the back of curb or edge of pavement must be provided.
   - Provide planting units generated at a rate of **1 PU per 15 linear feet** of right-of-way frontage, excluding driveways.
   - Plantings may include major deciduous trees, minor deciduous trees, and shrubs. Trees may be grouped or staggered to minimize conflicts with street trees. Shrubs must be a minimum of 24 inches in height at the time of installation, and reach a mature height of 30 to 42 inches.
   - A combination of plantings with a low pedestrian wall of no less than three feet in height may also satisfy the screening requirement.
2. Adjacent to residential properties, gas stations,car washes, or automotive service and repair must be screened by an opaque masonry wall, a solid wood or simulated wood screen fence, or a landscape strip. Landscape strips must meet the following requirements:
   - Evergreen trees or shrubs of at least 6 feet in height at maturity must be provided at a rate of **1 PU per 20 linear feet** of adjacent property line to be screened.
   - Planting strips must be a minimum of 10 feet in width.
3. This manual encourages the use of landscape areas required for screening to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section. Care shall be taken to avoid soil contamination from polluted runoff.



Condition J Sample Plan: Required Gas Station Planting
Scale: 1" = 60'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Right-of-Way	1 PU/ 15 LF	340 LF	23 PU
B	Residential	1 PU/ 20 LF	220 LF	11 PU

CONDITION K: Service Lanes and Drive-Through Lanes

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:



- Screen service activity areas from all adjacent properties, and public and private streets.
- Screen drive-through and service lanes adjacent to residential properties, and public and private streets, while providing appropriate visibility for security and surveillance.
- Help mitigate noise, fumes, and light from intensive uses adjacent to residential properties.
- Integrate onsite stormwater management into landscaping where appropriate.

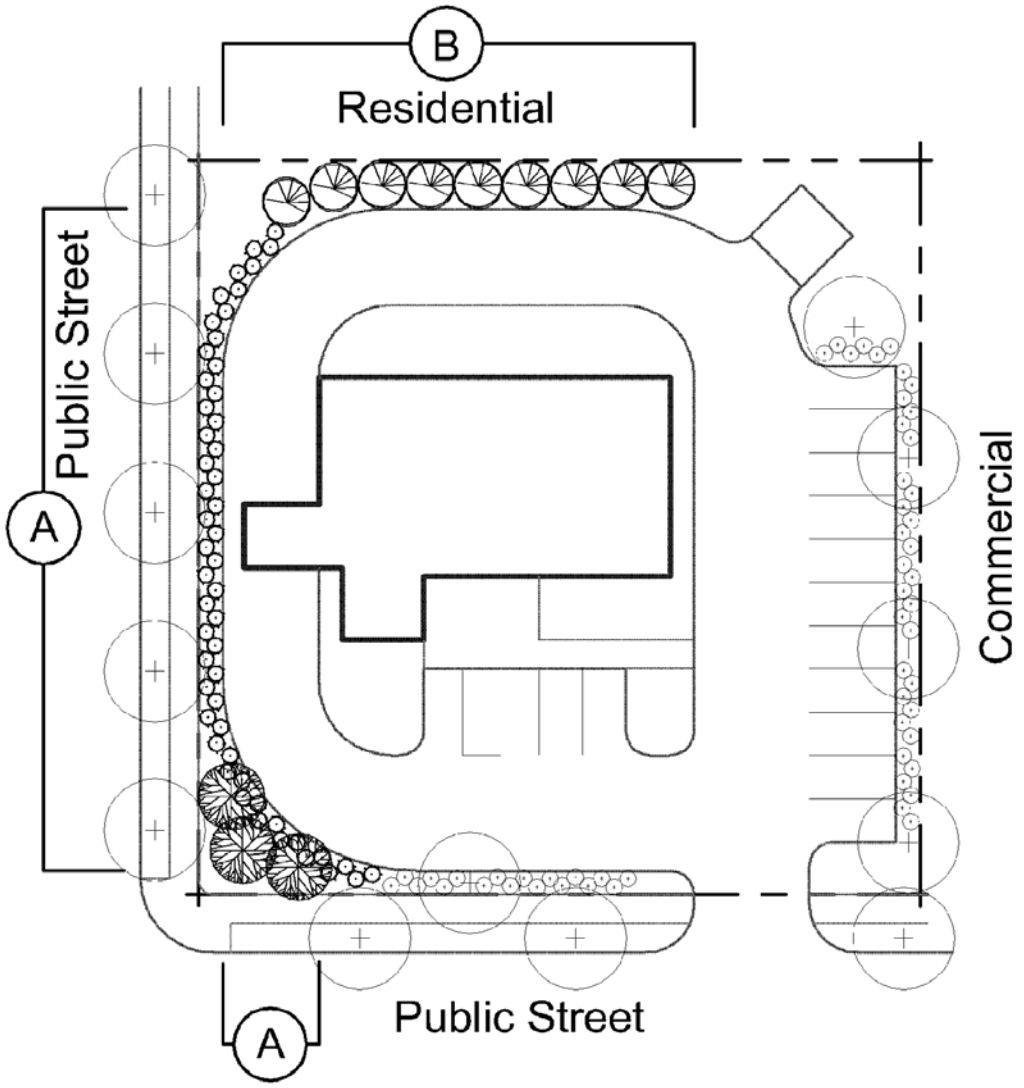
Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Screen all service lanes and doors, drive-through service lanes, stacking space area, and window/teller facilities from public or private right-of-way, excluding alleys, as follows:
   - A landscape strip of a minimum width of 5 feet, as measured from the right-of-way to the back of curb or edge of pavement must be provided.
   - Provide planting units generated at a rate of **1 PU per 15 linear feet** of right-of-way frontage, excluding driveways.
   - Plantings may include major deciduous trees, minor deciduous trees, shrubs, and perennials. Trees may be grouped or staggered to minimize conflicts with street trees. Shrubs must be a minimum of 24 inches in height at the time of installation, and reach a mature height of 30 to 42 inches.
   - Where a minimum width of 5 feet is not possible, the landscape strip may be reduced to 3 feet, and a combination of plantings with a low pedestrian wall of no less than three feet in height must be provided to satisfy the screening requirement. Planting must be located on the street side of the wall.
2. Adjacent to residential properties, all service lanes and doors, drive-through service lanes, stacking space area, and window/teller facilities must be screened by an opaque masonry wall, a solid wood or simulated wood screen fence, or a landscape strip. Landscape strips must meet the following requirements:

- Major deciduous trees, minor deciduous trees, evergreen trees, or shrubs of at least 6 feet in height at maturity must be provided at a rate of **1 PU per 20 linear feet** of distance to be screened.
- Planting strips must be a minimum of 10 feet in width.

3. This manual encourages the use of landscape areas required for service lane and drive-through lane screening to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.



Condition K Sample Plan: Required Drive-Through Planting
Scale: 1" = 40'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Right-of-Way	1 PU/ 15 LF	157 LF	10 PU
B	Residential	1 PU/ 20 LF	98 LF	5 PU

CONDITION L: Storage and Loading Areas

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of structures and landscape elements to achieve the following:

- Screen views of loading and storage areas from all adjacent properties, and public and private streets.
- Mitigate the impacts of noise producing activities on residential uses.
- Integrate onsite stormwater management into landscaping where appropriate.



Standards

No screening is required under this condition for the I-1, I-2 and MI Districts, however Condition O: Industrial Uses may apply to properties within these zones. Screening requirements for storage and loading areas of adjacent like uses may be waived by the SPRC. In addition to satisfying the intent of this condition, all storage and loading areas not exempted as described above must provide screening as follows:

General

1. This manual encourages the use of landscape areas required for screening to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.

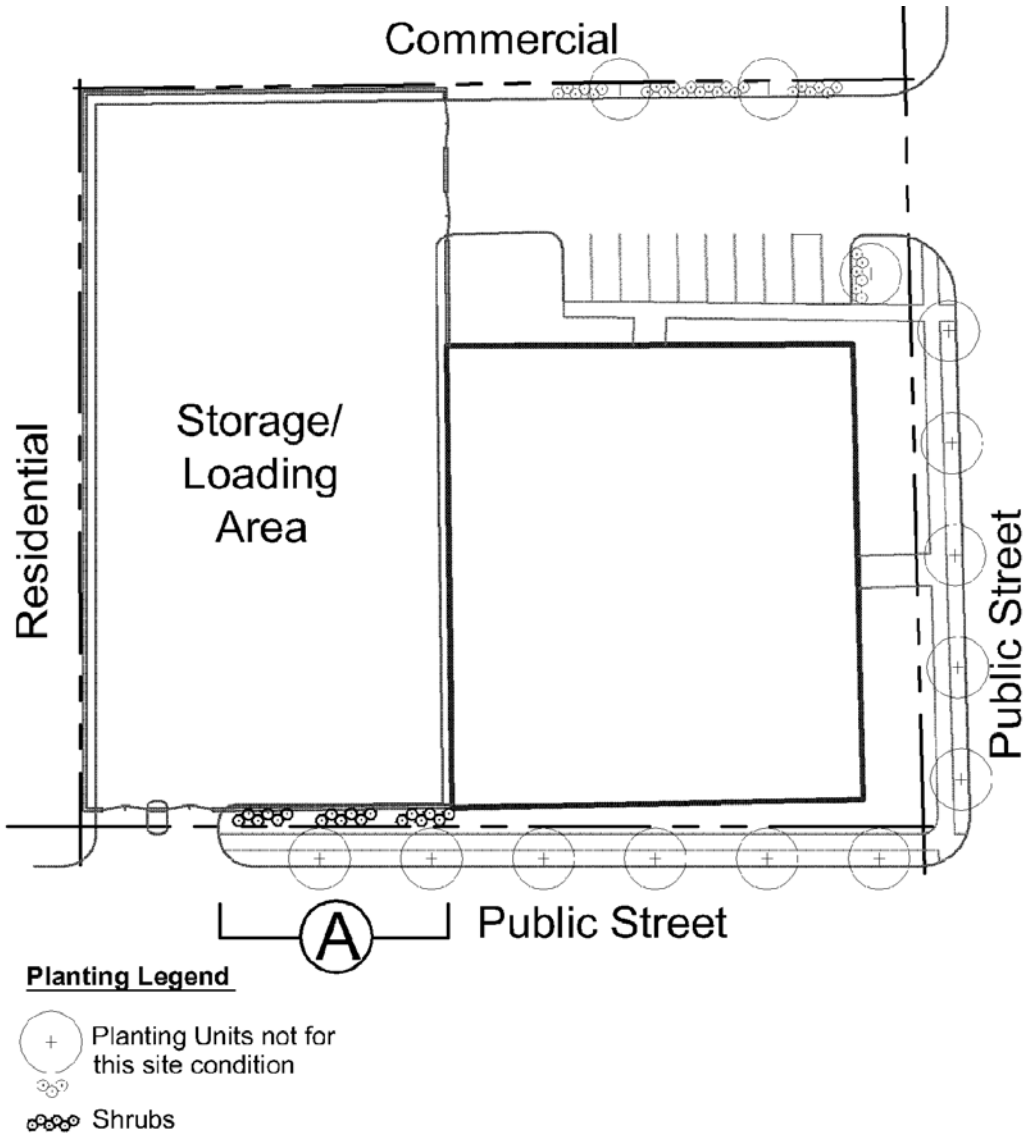
Storage

1. No materials stored or displayed outdoors may be of a greater height than that of the screening provided.
2. All outdoor storage areas must be completely screened by an opaque masonry wall or a solid wood or simulated wood screen fence no less than 6 feet in height. Storage areas may also be concealed within enclosures that are extensions of the building architecture with consistency of materials, color, and design.
3. Where walls or fences are required along the right-of-way, excluding alleys, planting shall be provided as follows:
    - Fencing or walls shall be set back a minimum of 5 feet from the property line, with planting on the street side.
    - Provide a minimum 5-foot wide landscape strip along the wall or fence. Wider landscape areas are encouraged where space allows.
    - Provide planting units generated at a rate of **1 PU per 25 linear feet** of wall or fence.
    - Plantings may include major deciduous trees, minor deciduous trees, and shrubs. Trees may be grouped or staggered to minimize conflicts with street trees. Shrubs

must be a minimum of 24 inches in height at the time of installation, and reach a mature height of 30 to 42 inches.

Loading

1. All loading areas must be completely screened from adjacent street right-of-ways and residential properties by an opaque masonry wall or a solid wood or simulated wood screen fence no less than 6 feet in height. Loading areas may also be concealed within enclosures that are extensions of the building architecture with consistency of materials, color, and design.
2. Where walls or fences are required along the right-of-way, planting shall be provided as follows:
   - Fencing or walls shall be set back a minimum of 5 feet from the property line, with planting on the street side.
   - Provide a minimum 5-foot wide landscape strip along the wall or fence. Wider landscape areas are encouraged where space allows.
   - Provide planting units generated at a rate of **1 PU per 25 linear feet** of wall or fence.
   - Plantings may include major deciduous trees, minor deciduous trees, and shrubs. Trees may be grouped or staggered to minimize conflicts with street trees. Shrubs must be a minimum of 24 inches in height at the time of installation, and reach a mature height of 30 to 42 inches.



Condition L Sample Plan: Required Storage & Loading Area Planting
Scale: 1" = 60'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Right-of-Way	1 PU/ 25 LF	70 LF	3 PU

CONDITION M: Solar Energy Systems, Mechanical Equipment, and Antennas

Intent

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements and architectural elements to achieve the following:

- Conceal ground-based mechanical equipment, solar energy systems, and antennas from public view.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

Mechanical Equipment & Solar Energy Systems

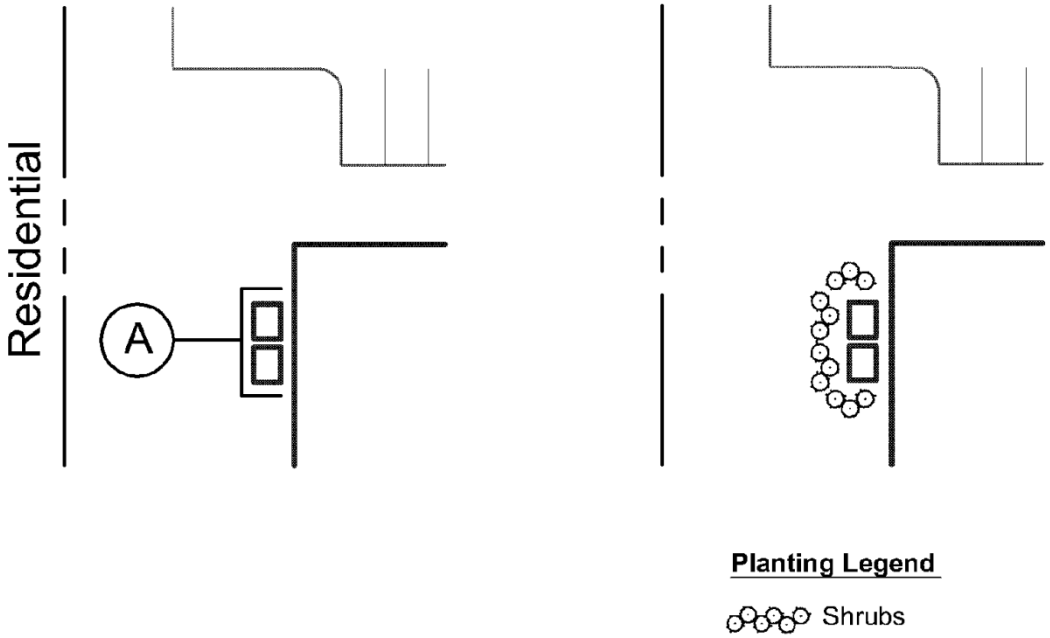


1. As specified in the Zoning Code, mechanical equipment for any use in a non-residential district adjacent to a residential, office-residential, or industrial mixed-use district must be located and screened so as not to be readily seen from the public right-of-way or adjacent residential, office-residential, or industrial mixed-use districts.
2. Solar energy systems located in or adjacent to a residential or office-residential district must be located and screened so as not to be readily seen from the public right-of-way or adjacent properties in residential or office-residential districts.
3. Where a principal or accessory structure, fence, wall, landscape elements, or a combination thereof enclose or block the view of ground-based mechanical equipment or solar energy systems, the equipment is considered screened.
4. Care must be used to account for the air space and maintenance access necessary for the proper function of the systems when locating screening elements, including landscaping.
5. Where fences or walls are used to provide screening, the color, style, and materials shall be compatible with the architecture of the primary structure. The height of fences or walls must be appropriate to size and location of the equipment to be screened.
6. Where landscaping is used as the method of screening mechanical equipment or solar energy systems, required planting must be provided at a rate of **1 PU per 20 linear feet** to be screened. Plantings may include evergreen trees and shrubs. At maturity, landscaping must be of a height adequate to provide year-round screening. At the time of installation, shrubs must be a minimum of 36 inches.

Antennas

1. As specified in the Zoning Code, satellite dish antennas greater than one meter in size must be located and screened so as not to be readily seen from public streets or adjacent properties.

2. Screening may include fences, plant materials, and/or earth berms. Screening may not impair the equipment's ability to receive signals.
3. All ground-mounted accessory equipment and the lower part of the support structure must be completely screened. Where feasible, evergreen trees must be installed to the side and rear of the antenna and at maturity reach a minimum height or elevation equal to the tallest portion of the dish.
4. Where fences are used to provide screening, the color, style, and materials shall be compatible with the architecture of the primary structure. The height of fences or walls must be appropriate to size and location of the equipment to be screened.
5. Where landscaping is used as the method of screening, required planting must be provided at a rate of **1 PU per 20 linear feet** to be screened. Plantings may include evergreen trees and shrubs. At maturity, landscaping must be of a height adequate to provide year-round screening. At the time of installation, shrubs must be a minimum of 36 inches.



Condition M Sample Plan: Required Mechanical Equipment Planting
Scale: 1" = 40'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Mechanical Equipment	1 PU/ 20 LF	30 LF	2 PU

CONDITION N: Telecommunication Facilities

Intent

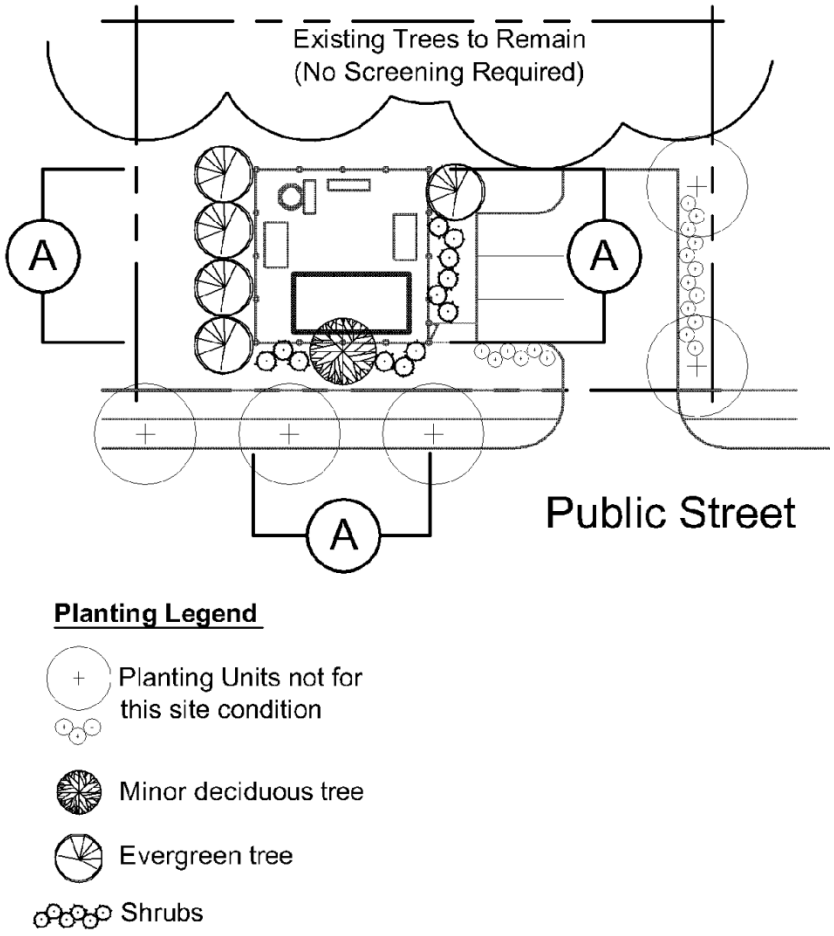
To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:

- Provide visual screening of communications towers and facilities.
- Integrate onsite stormwater management into landscaping where appropriate.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Existing mature tree growth and natural land forms on the site must be preserved to the maximum extent practicable. Screening requirements may be waived if adequate screening is demonstrated to exist on site.
2. A minimum 10-foot wide landscape strip shall be provided for telecommunication facilities to accommodate landscape screening requirements.
3. The required landscape strip may be reduced where ground-level structures and equipment associated with telecommunication towers are screened from view by an opaque fence or masonry wall of a minimum of six feet in height.
4. The landscape strip shall be planted at a rate of **1 PU per 20 linear feet** of distance to be screened. Plantings may include a combination of major deciduous trees, minor deciduous trees, evergreen trees, and shrubs. A minimum of 50% of the required planting units must be provided as evergreen trees.



Condition N Sample Plan: Required Telecommunication Facility Planting
Scale: 1" = 40'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Telecommunication Facility	1 PU/ 20 LF	108 LF	5 PU

CONDITION O: Industrial Uses

Intent

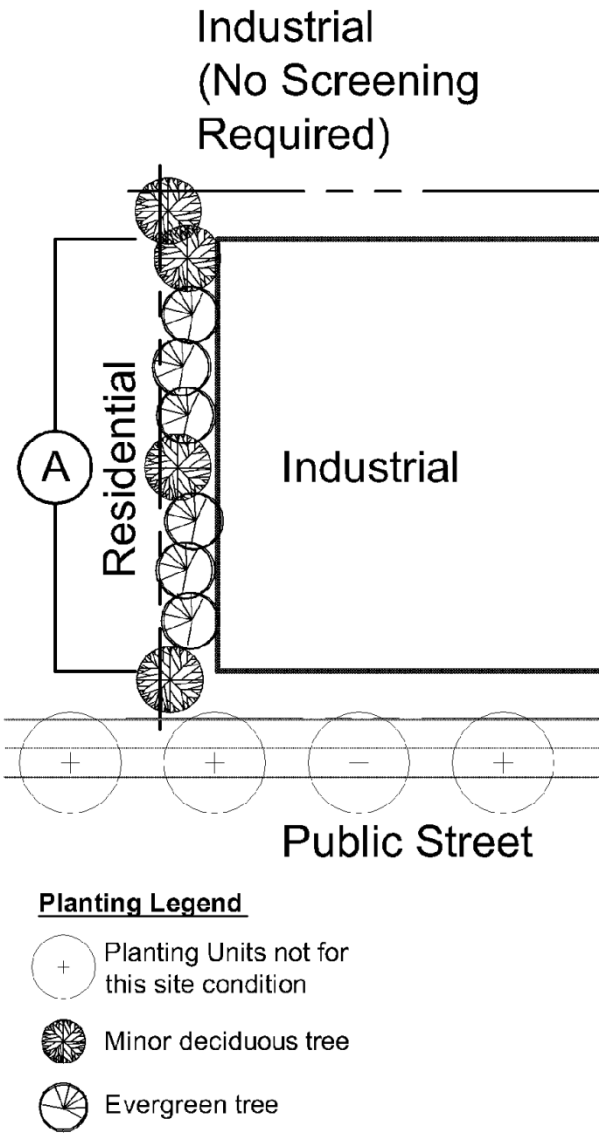
To satisfy the intent of this condition, the landscape design shall use a coordinated combination of landscape elements to achieve the following:

- Provide a compatible transition or buffer between residential, commercial, or office uses and more intense industrial uses.
- Mitigate the visual and acoustical impacts associated with incompatible land uses.
- Enhance the privacy of residential developments.
- Integrate onsite stormwater management into landscaping where appropriate.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. A 10-foot wide landscape strip must be provided within required side and/or rear yards where planting is required.
2. Regardless of zoning district or adjacent zoning districts, the following uses must be screened from public view as required in Title 14 of the Zoning Code. Plantings to screen these uses shall be calculated at a rate of at a rate of **1 PU per 20 linear feet** of distance to be screened. Plantings may include a combination of major deciduous trees, minor deciduous trees, evergreen trees, and shrubs.
    a. Junk or Scrap Storage and Yards
    b. Industrial Landfills
    c. Materials Recovery Facilities
    d. Recyclable Materials Recovery Facilities
3. When adjacent to a residential property, plantings to screen industrial development or redevelopment shall be calculated at a rate of at a rate of **1 PU per 20 linear feet** of distance to be screened. Plantings may include a combination of major deciduous trees, minor deciduous trees, evergreen trees, and shrubs.
4. When adjacent to an OR, C-1, C-2 or, C-3 District, development or redevelopment in an I-1, I-2, or MI District must meet the screening requirements described above.
5. For new development or redevelopment projects adjacent to existing industrial uses, the newer project must provide the landscape strip and required screening if no existing screening exists on the adjacent property.
6. This manual encourages the use of landscape areas required for screening to accommodate stormwater BMP facilities. Proposed plantings in these areas used to satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.



Condition O Sample Plan: Required Industrial Use Adjacent to Non-Industrial Use Planting
Scale: 1" = 40'

Key	Site Condition	Rate	Distance/Area	Required Planting
A	Industrial Use Adjacent to Residential	1 PU/ 20 LF	90 LF	5 PU

CONDITION P: Historic Structures and Landscapes

Intent

For the purposes of this condition, historic properties include:

- Baltimore City Landmarks
- Sites located within Baltimore City Historical and Architectural Preservation Districts
- Sites listed on the National Register of Historic Places.
- City-owned sites determined eligible by the Commission for Historical and Architectural Preservation (CHAP).

To satisfy the intent of this condition, the landscape design shall use a coordinated combination of site design techniques and landscape elements to achieve the following:



- Preserve the setting and landscape character of historic properties as appropriate, where the historic setting and landscape character are still present.
- Retain significant landscape features and vegetation associated with historic properties.
- Retain or frame significant views of historic structures and landscapes from the adjacent street or surrounding neighborhood.
- Provide visual and/or physical separation between historic structures or landscapes and incompatible uses or new development.
- Integrate onsite stormwater management into landscaping where appropriate.

Standards

In addition to satisfying the intent of this condition, landscape designs shall comply with the following standards:

1. Historic properties must comply with the Baltimore City Historic Preservation Design Guidelines for Historic Landscapes.
2. For historic properties, screening in the form of fences, walls, berms, and/or landscaping may be required where both possible and appropriate to screen incompatible adjacent uses. Method and style of screening provided must be compatible with the character of the historic property.
3. For new development adjacent to historic properties, screening in the form of fences, walls, berms, and/or landscaping may be required as necessary to preserve historic views or to screen incompatible adjacent uses.
4. Where landscape screening is provided, planting shall be calculated at a rate of **1 PU per 20 linear feet** of distance to be screened. Plantings may include a combination of major deciduous trees, minor deciduous trees, evergreen trees, and shrubs.
5. This manual encourages the use of landscape areas required for screening to accommodate stormwater BMP facilities. Proposed plantings in these areas used to

satisfy BMP planting requirements may also be credited towards the requirements for this condition, providing that they satisfy the intents and standards of this section.

APPENDIXES



APPENDIX A: Glossary

Afforestation. See Baltimore City Supplement to the State Forest Conservation Manual for definition.
ANLA. American Nursery and Landscape Association, formerly known as the American Association of Nurserymen.
Automotive Display Areas. Outdoor sales and display lots for motor vehicle dealerships or rental establishments.
Best Management Practices (BMP). Conservation practices or systems of practices and management measures that control soil loss and reduce water quality degradation caused by nutrients, animal waste, toxics, and sediments.
Berm. An earthen mound designed to provide visual interest on a site, screen undesirable views, provide noise reduction, and other functions.
Buffer Area. An area designated to protect an environmental resource or reduce the impact of dissimilar land uses.
Buffering. The use of landscaping, berms, walls, fences or any combination thereof, that provides physical and visual separation from one area to another.
Caliper. The diameter of a tree taken 6" above ground level up to and including 4" caliper size and 12" above the ground level for larger sizes.
Canopy. The area defined by the extent of the farthest edges of the crown of a major, minor, or evergreen tree, as identified through aerial photography or field survey.
City. The City of Baltimore, Maryland.
Clearing. The removal or material damage of landscape materials by disturbing, excavating or removing the underlying soil.
Critical Area. All parts of the Chesapeake Bay Critical Area, as delineated in and modified by the City in accordance with §8-1807 of the State Natural Resources Article and the Maryland State Critical Area Regulation (COMAR Title 27) that fall within City boundaries.
Critical Area Management Program (CAMP). The Baltimore City Critical Area Management Program, as adopted by Resolution of the Mayor and City Council of Baltimore and approved by the Chesapeake Bay Critical Area Commission.
Critical Root Zone. A circular region measured outward from a tree trunk representing the essential area of the roots that must be maintained or protected for the tree's survival; for the purpose of this manual, critical root zone is one foot of radial distance for every inch of tree diameter (DBH) measured at 4½ feet from the ground, with a minimum of 8 feet. For specimen trees, the formula is 1½ feet for every inch of tree diameter (DBH).
Deciduous. A plant with foliage that is shed annually.
Drive-Through Lane. Any private roadway used for access to or stacking space at windows used to dispense products or services through an attendant, window, or automated machine to customers in motor vehicles, including, but not limited to, drive-through restaurants and banks.
Evergreen. A plant with foliage that persists and remains green year-round.
Existing Soil. Soil existing on a site, which unlike native soil may contain backfill or debris.
Fence. An enclosure or barrier intended to mark a boundary, screen a view, or prevent intrusion.
Forest Conservation. The retention of existing forest or the creation of new forest as prescribed by the Maryland State Forest Conservation Act, the Department of Planning, and the Baltimore City Forest Conservation Manual.

Forest Conservation Plan. A plan approved pursuant to Subtitle 42 and 44 of the Baltimore City Code, Article 7, Division IV and the requirements of the Baltimore City Forest Conservation Manual.
Grass. Low growing plants which creep along the earth surface to form a solid mat or lawn. Only perennial grasses (those which live for more than one growing season) qualify to satisfy the requirements of the Landscape Manual.
Green Network. Natural areas such as forests and streams, as well as constructed elements such as urban parks, street trees, and stormwater management practices.
Groundcover. Low growing plants which grow in a spreading fashion to form a more or less solid mat of vegetation, and which are generally included in landscaped areas to prevent soil erosion by providing permeable cover for bare earth.
Hedge. Shrubs planted in a continuous line which will block at least 80% of a view in a maximum of two growing seasons after installation.
Historic Property. Sites designated as Baltimore City Landmarks, sites located within City Historical and Architectural Preservation Districts, sites listed on the National Register of Historic Places, and/or City-owned sites determined eligible by the Commission for Historical and Architectural Preservation.
Invasive. A plant that is both non-native and able to establish on many sites, grow quickly, and spread to the point of disrupting plant communities or ecosystems.
Irrigation. An adequate supply of water which can be made available to landscape plants including but not limited to underground sprinkler systems or hose bibs.
Landscape. The addition of trees, plants and other natural and decorative features to land.
Landscaped Area. That area within the boundaries of a given site which is devoted to and consists of landscape material.
Landscape Material. Includes inorganic features such as planters, stone, brick, and aggregate forms, water, and other landscape elements when used to enhance live plants; provided, however, that the use of inorganic materials or grass in combination with inorganic materials shall not predominate over the use of live plants. Artificial plants do not qualify as landscape material.
MDLTE/ISA.
Native. A plant that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. Only plants found in this country before European settlement are considered to be native to the United States.
Native Soil. Soil original to the location of the project site, free of amendments, backfill, or debris.
Open Space. Land retained in an essentially undeveloped state, or developed and used for outdoor living, recreation, pedestrian access, or landscaping. Open space can be private or public.
Plants. Including but not limited to live trees, shrubs, groundcovers, grasses, and perennials, otherwise known as softscape.
Planting Area. An area of land designated for plants.
Planting Unit. A unit of measure for determining the quantity of plants required.
Protected Tree. Street trees, Public Trees, trees within properties or rights-of-way designated as Baltimore City Landmarks by City ordinance, Specimen Trees, and/or Significant Trees.
Public Tree. Any tree existing on City property.
Redevelopment. The process of developing land which is or has previously been developed.

Screening. Landscaping, berms, fences, walls, or any combination thereof used to block or significantly obscure, in a continuous manner, the view from one area to another.
Shrub. Woody or semi-woody perennial plant that is customarily included in landscape designs to provide for lower scale buffering and visual interest.
Sight Triangle. The area on either side of an intersection, within which clear visibility of traffic and pedestrians must be maintained.
Significant Tree. Trees 12 inches DBH or greater for major/canopy trees and 8 inches DBH or greater for understory/minor trees, located within required setbacks or within 10 feet of a public property or right-of-way.
Specimen Tree. Tree having a diameter measured at 4.5 feet above the ground of 20 inches or more or trees having 75% or more of the diameter of the current state champion tree of that species.
Steep Slopes. Areas with slopes greater that 20 percent.
Stormwater Management. The management of stormwater runoff, often using water retention, filtration, and infiltration facilities, to provide controlled release of stormwater into receiving streams.
Street Tree. Trees planted within a public street right-of-way.
Tree. A woody perennial plant that is greater than 15 feet in height at maturity and usually characterized by a single trunk.
Tree, Evergreen. An evergreen plant with a mature height exceeding 15 feet.
Tree, Major Deciduous. A deciduous tree with a mature height of 30 feet or greater.
Tree, Minor Deciduous. A deciduous tree with a mature height less than 30 feet.

APPENDIX B: Landscape Plan Requirements

The submittal requirements for a landscape plans include existing conditions, planting, and site information. The requirements for Concept Landscape Plans differ from those for Final Landscape Plans. In addition to the elements required by the Site Plan Review Guidelines, all projects adhering to the requirements of the Landscape Manual must include the following information:

Existing Conditions

In addition to the elements required by the Site Plan Review Guidelines and Environmentally Sensitive Areas Review:

- Extent of existing trees and/or forest
- Location, species, size (DBH), and health of all Protected Trees or any existing trees to be retained for credit towards Landscape Manual requirements

Concept Landscape Plan

The Concept Landscape Plan shall be the same scale as the site plan and must include a north arrow, drawing scale, property lines, existing topography, site layout, adjoining properties and uses, and any other information pertinent to the review. Include:

- Name, location, and right-of-way widths of all abutting streets,
- Locations of existing utilities, including overhead wires,
- Locations of existing natural features such as ponds, lakes and streams,
- Delineation of the 100 year floodplain, Critical Area boundaries, non-tidal wetlands, and wetland buffers, if applicable,
- Locations of existing vegetation to remain on site,
- Location, species, and size of Specimen Trees and Significant Trees within 50’ of the Limit of Disturbance,
- Locations of existing vegetation within 25’ of the project boundaries, depicted with symbols scaled to the canopy’s average extent,
- Conceptual locations of stormwater BMPs,
- Locations of any slopes proposed at 3:1 or steeper and 2:1 or steeper, if conceptual grading is available,
- Conceptual locations and limits of tree pits, planters, planting beds, and grass/lawn areas,
- Conceptual locations and descriptions of required landscape improvements, such as earth berms, walls, and fences,
- Conceptual locations of any other landscape improvements proposed beyond those required by the Landscape Manual, including walls, fences, screens, sculptures, fountains, street furniture, lights and paved areas, shown to provide context for review (may be distinguished from required elements using graphic differentiations such as labels, symbols, line weights, or color),

- A chart tabulating the total required replacement mitigation required based upon preliminary analysis of trees to be protected and/or removed,
- A chart tabulating the number of planting units required by the conditions of the Landscape Manual, and
- Proposals for any anticipated alternative compliance. Proposals must be accompanied by sufficient explanation and justification, in written and/or graphic form, to allow appropriate evaluation and decision.

In addition to the required elements listed above, Concept Landscape Plans have the option to include any additional items required for the Final Landscape Plan, listed below.

Final Landscape Plan

The Final Landscape Plan submission shall include plans and details at a scale or scales sufficient to convey the fulfillment of the Landscape Manual requirements. The plans must include a north arrow, drawing scale, property lines, existing topography, proposed grades, site layout, adjoining properties and uses, and any other information pertinent to the review. Include:

- Name, location, and right-of-way widths of all abutting streets,
- Locations of all existing and proposed utilities, including overhead wires,
- Locations of all existing and proposed easements,
- Locations of existing natural features such as ponds, lakes and streams,
- Delineation of the 100 year floodplain, Critical Area boundaries, non-tidal wetlands, and wetland buffers, if applicable,
- Locations of all existing trees and plants to remain on site,
- Location, species, and size of Specimen Trees and Significant Trees within 50' of the Limit of Disturbance,
- Locations of existing vegetation within 25' of the project boundaries, depicted with symbols scaled to the canopy's average extent,
- Locations of stormwater BMPs,
- Locations of any slopes proposed at 3:1 or steeper and 2:1 or steeper, if conceptual grading is available,
- Locations and labels of all proposed plants,
- Locations and limits of tree pits, planters, planting beds, and grass/lawn areas,
- Locations and descriptions of required landscape improvements, such as earth berms, walls, and fences,
- Locations of any other landscape improvements proposed beyond those required by the Landscape Manual, including plants, walls, fences, screens, sculptures, fountains, street furniture, lights and paved areas, shown to provide context for review (may be distinguished from required elements using graphic differentiations such as labels, symbols, line weights, or color),
- A plant list or schedule including the botanical name, common name, quantity, spacing and size at time of planting (height, caliper, and/or container size, as appropriate) of all proposed plants,

- A chart tabulating the number of planting units required by the conditions of the Landscape Manual and the number of planting units provided on the plan
- Details and notes for planting installation, planting beds, soil amendments, and other landscape improvements as necessary to determine compliance with the Landscape Manual,
- Locations and descriptions of all proposed irrigation methods,
- For plans requesting credit for BMP plantings toward Landscape Manual requirements, include the landscape plans submitted as part of the Stormwater Design plans as part of the submittal of the landscape plan unless plantings are shown elsewhere within the landscape plan submission.
- Tree Protection Plan, including details and notes describing the method of protection for existing trees to be preserved
- Tabulation of total required afforestation or replacement mitigation required,
- Tabulation of total afforestation or replacement mitigation proposed on site,
- Tabulation of total replacement mitigation to be satisfied off-site or through fee-in-lieu (if required)

Sample Charts & Tabulations

Sample Mitigation Tabulations

Key	Common Name	Species	Size (DBH)	Condition	Required Mitigation
T1	Sugar Maple	Acer saccharum	20”	Good	20”
T2	White Oak	Quercus alba	18”	Fair	18”
Total					38”

Sample Planting Unit Tabulations

Site Condition	Rate	Distance/Area	PU Required
Street Frontage	1 PU/35 LF	270	8 PU
Parking Lot Perimeter – Major Trees	1 PU/35 LF	160	5 PU
Parking Lot Perimeter - Shrubs	1 PU/20 LF	160	8 PU
Drive Through Lanes – Right-of-Way	1 PU/15 LF	157	10 PU
Drive Through Lanes - Residential	1 PU/20 LF	98	5 PU
Total			36 PU

Sample Plant List & Provided Planting Units/Mitigation Tabulations

Quant.	Common Name	Botanical Name	Size Ht/Cal.	Total PU	Total Mitigation
8	Red Oak	Quercus rubra	2.5” Cal.	8 PU	20”
5	London Planetree	Platanus x acerifolia	3” Cal.	5 PU	15”
3	Eastern Redbud	Cercis canadensis	1.5” Cal.	1.5 PU	4.5”
9	Eastern Red Cedar	Juniperus virginiana	6’ Ht.	4.5 PU	-
48	Cherry Laurel	Prunus laurocerasus	24” Ht.	8 PU	-
60	Compact Inkberry	Ilex glabra	24” Ht.	10 PU	-
Total				37 PU	39.5”

APPENDIX C: Guidelines for Screening

Specific screening requirements are included within the project site conditions. The following design guidelines apply to all screening, walls, and fencing provided under the requirements of the Landscape Manual.

Landscape Screening

Landscape screening must be designed, placed, and maintained in good condition so as to achieve the desired intent and not obstruct vehicle sight distances at entrances and exits.

The height, density, and opacity of required screening may vary according to site conditions. Screening may range from a solid linear screen where maximum opacity is needed, to a loosely staggered screen where filtered views are desired. Evergreen or tightly branching deciduous plants may be desirable to increase the year-round impact of screening. Where safety is a concern, screening may be provided at a density which restricts pedestrian movement, to limit site access to planned, highly visible locations.

The spacing, location, and types of plants will be influenced by the character of the project. Plantings may be evenly spaced where a formal design style is desired or asymmetrically grouped where a more informal or natural design is desired for the character of the project. A variety of plant species may be used to enhance biodiversity and provide seasonal interest.

Fencing & Walls

Fencing or walls shall be constructed of attractive, durable, low-maintenance materials compatible with the character of the neighborhood and/or the architectural character of adjacent buildings. For board-on-board fences used for screening, the minimum wood panel thickness shall be ¾-inch. The minimum frame size shall be 2x4 and minimum post 4x4. Where security fencing is used along public right-of-way, it shall be ornamental in character, such as metal pickets with masonry piers, and constructed of attractive, durable, low-maintenance materials.

Monotonous stretching of a single fence or wall type shall be relieved by introducing changes in the fencing height, material, offsets, or other articulation. Planting may be placed along fences or walls to relieve monotony. Fence or wall location must avoid the creation of dead spaces between properties that are difficult to maintain or secure. Fencing or walls along public right-of-way shall be set back a minimum of 5 feet to allow planting on the street side of the structure.

APPENDIX D: Recommended and Prohibited Plants

Native Species

The use of native plant species is encouraged. Native plant guides for the region are available through the US Fish and Wildlife Service Bayscapes program or the University of Maryland Extension. Appendix A of the Maryland Stormwater Design Manual contains landscape guidance for stormwater BMPs, including suggested species for various types of practices and facilities.

Tree Planting

Below is a list of preferred species for tree plantings. The criterion for selection of this list was:

- Predominantly Coastal Plain or Piedmont native or naturalized species
- Ability to perform the desired dynamic function in the community as planted
- Commercial availability
- Anticipated survival and hardiness
- Lack of invasive qualities

Some tree species not listed may be acceptable for planting with permission from the Planning Department.

Botanical Name	Common Name	Major (M) or Minor (m) Deciduous Tree	Native	Urban Tolerant	Under Utility Lines	Narrow or Columnar	Not for Streets/Parking
Acer buergeranum	Trident Maple	m		*	*		
Acer x freemanii 'Autumn Blaze'	Freemanii Maple	M					
Acer x freemanii ‘Armstrong’	Armstrong Maple	M				*	
Acer x freemanii ‘Bowhill’	Bowhill Maple	M				*	
Acer ginnala	Amur Maple	m		*	*		
Acer negundo	Box Elder	M	*	*			*
Acer rubrum 'Armstrong'	Armstrong Red Maple	M	*			*	
Acer rubrum 'Bowhall'	Bowhall Red Maple	M	*			*	
Acer rubrum 'Columnare’	Columnare Red Maple	M	*			*	
Acer rubrum 'October Glory'	October Glory Red Maple	M	*				
Acer rubrum ‘Red Sunset’	Red Sunset Red Maple	M	*				
Acer saccharinum	Silver Maple	M	*	*			*
Acer saccharum ‘Legacy’	Legacy Sugar Maple	M	*				
Aesculus x carnea ‘Briotii’	Briotii Red Horsechestnut	M		*			
Aesculus hippocastanum	Common Horsechestnut	M		*			

Tree Planting (continued)

Botanical Name	Common Name	Major (M) or Minor (m) Deciduous Tree	Native	Urban Tolerant	Under Utility Lines	Narrow or Columnar	Not for Streets/Parking
Aesculus pavia	Red Buckeye	m			*		
Amelanchier canadensis	Serviceberry	m	*		*		
Betula nigra ‘Heritage’	Heritage River Birch	M	*				*
Carpinus betulus 'Fastigata’	Columnar European Hornbeam	M		*		*	
Carpinus caroliniana	American Hornbeam	M	*				
Celtis occidentalis	Common Hackberry	M	*	*			
Cercis canadensis	Eastern Redbud	m	*	*	*		
Cerdidiphyllum japonicum	Katsuratree	M					
Cladrastis lutea	American Yellowwood	M					
Cornus florida	Flowering Dogwood	m	*		*		*
Cornus florida 'Appalachian Spring'	Appalachian Spring Dogwood	m	*		*		
Cornus kousa	Kousa Dogwood	m			*	*	
Crataegus crusgalli	Cockspur Hawthorn	m	*	*	*	*	
Crataegus x lavellei	Lavelle Hawthorne	m		*	*	*	
Crataegus phaenopyrum	Washington Hawthorn	m		*	*	*	
Crataegus viridis	Green Hawthorn	m	*	*	*	*	
Ginkgo biloba ‘Autumn Gold’	Autumn Gold Ginkgo	M		*			
Ginkgo biloba ‘Sentry’	Sentry Ginkgo	M		*		*	
Ginkgo biloba (female)	Ginkgo (female)	M		*			*
Gleditsia triacanthos ‘Shademaster’	Shademaster Honeylocust	M		*			
Gymnocladus dioicus (female)	Kentucky Coffee Tree (female)	M					*
Gymnocladus dioicus 'Espresso'	Kentucky Coffeetree 'Espresso'	M					
Ilex opaca	American Holly		*	*			*
Juglans nigra	Black Walnut	M	*	*			*
Liquidambar styraciflua ‘Rotundaloba’	Rotundaloba Sweetgum	M	*				
Liriodendron tulipifera	Tulip Poplar	M	*				*
Magnolia virginiana	Sweetbay Magnolia	m	*	*	*	*	
Malus spp.	Flowering Crabapple	m		*	*		
Nyssa sylvatica	Blackgum	M	*				
Ostrya virginiana	American Hophornbeam	M	*				
Oxydendrum arboreum	Sourwood	M			*		
Platanus x acerifolia	Bloodgood London Plane	M		*			

Tree Planting (continued)

Botanical Name	Common Name	Major (M) or Minor (m) Deciduous Tree	Native	Urban Tolerant	Under Utility Lines	Narrow or Columnar	Not for Streets/Parking
Platanus occidentalis	American Sycamore	M	*	*			
Prunus americana	American Wild Plum	m	*		*		*
Prunus sargentii	Sargent Cherry	m					
Prunus serotina	Black Cherry	M	*				*
Prunus x incamp 'Okame'	Okame Flowering Cherry	m			*		
Prunus x yedoensis	Yoshino Cherry	m			*		
Quercus alba	White Oak	M	*				
Quercus bicolor	Swamp White Oak	M	*	*			
Quercus coccinea	Scarlet Oak	M	*				
Quercus imbricaria	Shingle Oak	M					
Quercus macrocarpa	Bur Oak	M		*			
Quercus palustris	Pin Oak	M	*	*			
Quercus phellos	Willow Oak	M	*	*			
Quercus rubra	Northern Red Oak	M	*				
Robinia pseudo-acacia	Black Locust	M					*
Salix sericea	Silky Willow	m	*		*		*
Sassafras albioum	Sassafras	M	*	*			*
Syringa reticulata 'Ivory Silk'	Ivory Silk Japanese Tree Lilac	m		*	*	*	
Tilia cordata ‘Greenspire’	Greenspire Little Leaf Linden	M		*			*
Tilia americana 'Redmund'	Redmund Linden	M	*				
Tilia tomentosa	Silver Linden	M		*			
Ulmus americana ‘Liberty'	Liberty American Elm	M		*			
Ulmus americana ‘New Harmony’	New Harmony American Elm	M		*			
Ulmus americana 'Princeton'	Princeton American Elm	M		*			
Ulmus americana ‘Valley Forge’	Valley Forge American Elm	M		*			
Zelkova serrata ‘Greenvase’	Greenvase Japanese Zelkova	M		*			
Zelkova serrata ‘Village Green’	Village Green Japanese Zelkova	M		*			

The Baltimore City Recreation and Parks Division of Forestry maintains a list of tree species recommended for or prohibited from planting within the right-of-way.

Plants Recommended for Slope Stabilization

Common Name	Botanical Name
Grasses	
Big Bluestem	Andropogon gerardii
Northern Sea Oats	Chasmanthium latifolium
Deer-Tongue	Dichanthelium clandestinum
Canada Wild Rye	Elymus Canadensis
Switchgrass	Panicum virgatum
Little Bluestem	Schizachyrium scoparium
Herbaceous Plants	
Butterflyweed	Asclepias tuberose
Threadleaf Coreopsis	Coreopsis verticillata
Green-stemmed Joe-Pye Weed	Eupatorium purpureum
Orange Coneflower	Rudbeckia fulgida
Black-Eyed Susan	Rudbeckia hirta
Heath Aster	Symphiotrichum ericoides
Smooth Aster	Symphiotrichum laevum
Shrubs	
Summersweet	Clethra alnifolia
Sweetfern	Comptonia peregrine
Gray Dogwood	Cornus racemosa
Virginia Sweetspire	Itea virginica
Northern Bayberry	Myrica pensylvanica
Fragrant Sumac	Rhus aromatica
Lowbush Blueberry	Vaccinium angustifolium
Maple-Leaved Arrowwood	Viburnum acerifolium
Trees	
Sugar Maple	Acer saccharum
Downy Serviceberry	Amelanchier arborea
Common Hackberry	Celtis occidentalis
Pagoda Dogwood	Cornus alternifolia
Eastern Red Cedar	Juniperus virginiana
Black Gum	Nyssa sylvatica
Eastern Hop-hornbeam	Ostrya virginiana
Scarlet Oak	Quercus coccinea
Northern Red Oak	Quercus rubra

Note:
Other appropriate species not listed may be acceptable for planting with permission from the Planning Department.

Prohibited Plants

The species listed below as prohibited have been identified due to characteristics that include invasiveness, susceptibility to pests, susceptibility to disease, or structural issues. These characteristics may lead to issues such as the potential alteration of natural ecosystems through the spread of invasive species and problems with the long-term health of species prone to pests or disease.

Some prohibited species may be acceptable for planting with permission from the Planning Department, provided that their use is justified for particular project or site conditions. Species may be approved on a case-by case basis if requested, provided that they are planted in a location or manner that minimizes the risk of their spread to other properties.

Common Name	Botanical Name
Trees	
Norway Maple (all varieties)	Acer platanoides
Tree of Heaven	Ailanthus altissima
Silktree	Albizia julibrissin
Japanese Angelica Tree	Aralia elata
Paper Mulberry	Broussonetia papyrifera
Russian Olive	Eleagnus angustifolium
Autumn Olive	Eleagnus umbellata
White Ash	Fraxinus americana spp.
Green Ash	Fraxinus pennsylvanica spp.
White Mulberry	Morus alba
Princess Tree	Paulawnia tomentosa
Amur Cork Tree	Phellodendron amurense
Callery Pear (all cultivars)	Pyrus calleryana
Sawtooth Oak	Quercus acutissima
Weeping Willow	Salix x sepulcralis
Chinese Elm	Ulmus parvifolia
Siberian Elm	Ulmus pumila
Shrubs	
Japanese Barberry	Berberis thunbergii
Winged Euonymous	Euonymus alatus
Rose of Sharon	Hibiscus syriacus
Bush Honeysuckle	Lonicera spp.
Blunt-leaved Privet	Ligustrum spp.
Multiflora Rose	Rosa multiflora
Wineberry	Rubus phoenicolasius
Japanese Spiraea	Spiraea japonica

Prohibited Plants (continued)

Common Name	Botanical Name
Grasses	
Common Bamboo	Bambusa vulgaris
Pampas Grass	Cortaderia selloana
Japanese Knotweed	Polygonum japonicum
Japanese Silver Grass	Miscanthus sinensis
Golden Bamboo	Phyllostachys aurea
Japanese Timber Bamboo	Phyllostachys bambusoides
Arrow Bamboo	Pseudosasa japonica
Johnsongrass	Sorghum halepense
Vines & Groundcovers	
Five-Leaf Akebia	Akebia quinata
Porcelain Berry	Ampelopsis brevipedunculata
English Ivy	Hedera helix
Creeping Liriope	Liriope spicata
Japanese Honeysuckle	Lonicera japonica
Mile-a-Minute Vine	Polygonum perfoliatum
Kudzu	Pueraria lobata
Oriental Bittersweet	Solanum dulcamara
Vinca, Periwinkle	Vinca minor
Japanese Wisteria	Wisteria floribunda
Herbaceous	
Canada Thistle	Cirsium arvense
Japanese Hops	Humulus japonicus
Purple Loosestrife	Lythrum salicaria
Lesser Celandine, Buttercup	Ranunculus ficaria

APPENDIX E: Planting Standards

The following section describes the required standards for the preservation and planting of plant materials required by the Landscape Manual. All tree protection, landscape installation, and landscape maintenance work shall be done in accordance with ANSI A300 standards.

The City of Baltimore Standard Specifications 2006, otherwise known as The Greenbook, contains technical specifications to be used for the construction of projects located on City of Baltimore properties or within City right-of-way. Plantings located on City property or within the right-of-way must meet the Green Book standards in addition to meeting the requirements of this manual.

Tree Preservation Standards

The developer and plan preparer are encouraged to preserve the maximum number of trees in accordance with the following guidelines:

Planning, Design, & Plan Submission

- The extent of existing trees or forest, and any other environmentally sensitive areas on the site must be shown on the existing conditions plan, in accordance with Section 4-304 of the Zoning Code. All Protected Trees must be identified on the existing conditions plan with the species, size, and health shown and special conditions noted.
- Site planning and architectural design techniques shall be used to minimize impacts on areas with the most desirable trees and ensure that adequate room is provided for construction access while protecting natural features and minimizing site disturbance to the extent practicable.
- The following characteristics must be evaluated in selecting trees to be saved and protected or removed: tree species, age, health, and structure. Trees that are diseased, in failing health, exhibit structural defects which present a potential hazard must be removed. Invasive species may also be removed.
- For existing trees in close proximity to the proposed construction area and infrastructure, the following determinants shall be used in selecting trees to be saved: a circle representing the critical root zone shall be drawn around the tree. If two-thirds of the area can remain undisturbed at original grades, the tree shall be saved, and may not need special treatment.
- Identify location and type of tree protection measures to be implemented, including tree protection fencing, root pruning, mulch, and supplemental watering.
- To provide incentives for tree protection during construction, construction contracts must include financial penalties to the contractor for the removal, damage, or death of protected trees.

Prior to Construction

- All existing trees within the right-of-way must be protected from construction activities, unless their removal has been approved by the City Arborist.

- Tree protection fence is required for all projects during construction. The fence shall be installed along the limits of disturbance adjacent to any tree protection areas. If the tree(s) being protected are within the limits of disturbance, the tree protection fence must be equal to the critical root zone, or as approved by City staff.
- Tree protection area signs must be affixed to all tree protection fencing at 30' spacing, on average. Signs are not to be affixed directly to trees.
- All tree protection measures must be in place at the time of Sediment and Erosion Control inspection, prior to commencement of demolition, site clearing, grading or construction and maintained throughout construction.

During Construction

- All work near tree preservation areas shall be performed in such a manner as to minimize damage to trees, shrubs, ground cover, soil and root systems. No work should be undertaken within tree preservation areas. Activities prohibited within the tree protection area include but are not limited to:
    - Operating or parking construction equipment
    - Storage of construction material or debris
    - Stockpiling of soil or other materials
    - Alteration of grades in adjacent areas which will cause drainage to flow into, or to collect in protected areas
- All trees to be removed must be removed in a manner that will not damage the remaining trees.
- Any trees that are to remain that are damaged during the clearing operation must be repaired or removed and replaced in an approved manner by an MDLTE/ISA certified arborist as soon as final clearing has been completed.
- Root pruning may be necessary for projects where the critical root zone is impacted, as determined by the plan preparer or an MDLTE/ISA certified arborist. Pruning shall be along the limits of disturbance adjacent to tree protection fencing. A certified arborist shall supervise or conduct root pruning.
- Existing trees which are retained may experience shock caused by the construction activity. All possible safeguards must be taken to minimize these effects and to provide optimum growth conditions. Measures may include watering, mulching, pruning and/or fertilizing protected trees.

Following Construction

- After construction is completed and accepted, remove protection measures from preservation areas.
- Implement additional measures as needed to aid tree recovery from construction.

If the tree protection requirements described above cannot be met, an alternative tree preservation plan may be submitted by an MDLTE/ISA certified arborist or qualified professional. The alternate tree preservation plan must show alternative means for tree protection and preservation, and include a statement by the arborist or qualified professional that the plan provides the same level of protection as the requirements of this manual.

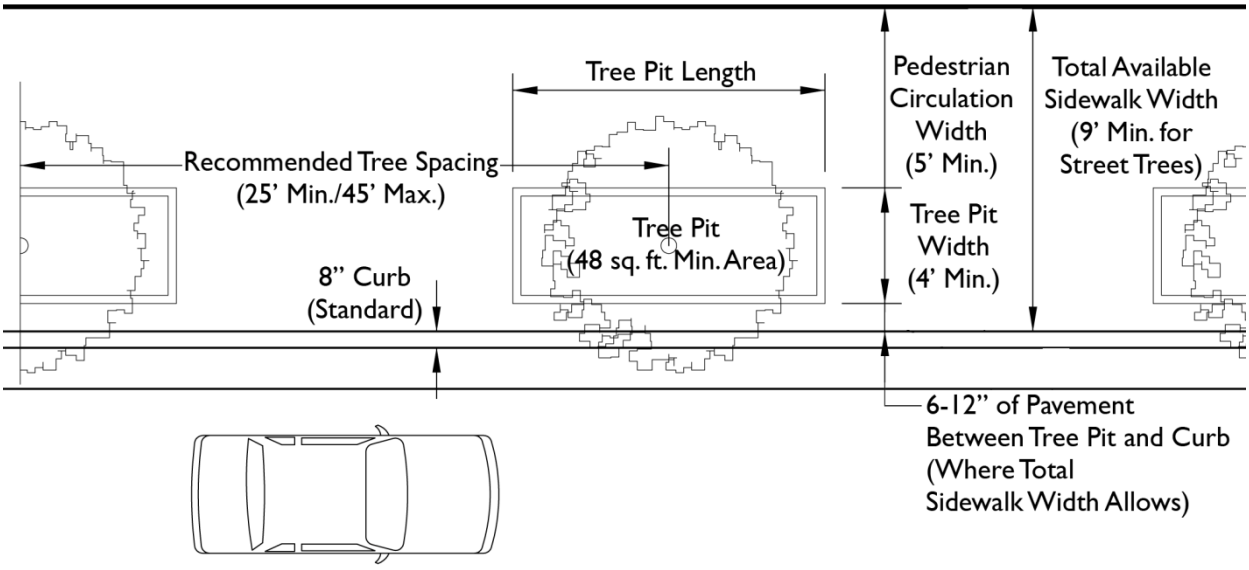
Street Tree Planting & Tree Pit Standards

Street trees within the right-of-way must be planted in tree pits or landscape strips parallel to the sidewalk. In addition to meeting the General Planting Standards described in the following section, the planting of street trees must also meet the standards of the City of Baltimore Standard Specifications 2006. According to the provisions of the City Code, trees planted in public right-of-way or in a public easement require a permit issued by the Baltimore City Department of General Services.

Where trees are to be planted within the right-of-way, a minimum walkway width must be maintained in accordance with Americans with Disabilities Act (ADA) requirements. Wider walkway dimensions are permitted where right-of-way widths permit, and wider tree planting areas are encouraged where space allows.

Tree pits must be adequately sized to allow for ample growing space for tree roots and crown. The minimum area for all tree pits shall be 48 square feet. The overall width of the right of way, required sidewalk width, and locations of underground utilities may limit the width of a tree pit.

The following minimum dimensions apply to the design of tree pits, to provide adequate soil volumes for trees while maintaining adequate space for pedestrian circulation. The minimum width standards also apply to continuous landscape strips.



Sample Plan: Minimum Tree Pit and Pedestrian Circulation Dimensions
Scale: Not to Scale

Table: Minimum Tree Pit and Pedestrian Circulation Dimensions

Available Sidewalk Width	Minimum Width & Length of Tree Pit	Minimum Area of Tree Pit
9’	4’ width x 12’ length	48 square feet
10’-12’	4-6’ width x 8-12’ length	48 square feet
13’ or greater	7’ width* or greater x 7-10’ length	48 square feet

*With 6 to 12 inches of pavement along the curb where total width allows and on-street parking is provided

The creation of continuous tree pits or landscape strips is encouraged wherever possible to provide adequate soil volumes for trees. See Appendix F for planting soil standards and alternative techniques to provide trees with adequate soil volumes in urban conditions. Both new and existing tree pits must include soil amendments in accordance with the soil standards.

To discourage soil compaction within tree pits, edge treatments may be required along three sides of each tree pit (excluding the curb side) in areas with high levels of pedestrian traffic. Pervious pavement within tree pit areas will be permitted only where pedestrian traffic is required over rooting area and at approval of the Department of Planning. Edge treatments may consist of pervious pavement, a tree pit guard, or other approved method. Raised edge treatments, such as curbs, around tree pits are discouraged, as they prevent water from nearby impervious surfaces from draining to and infiltrating the soil in the tree pit.

A tree pit guard is a device installed around the edge of a tree pit for protection. Approved tree pit guard types include a low metal fence or wickets from 18" to 24" high, extending along three sides of the tree pit, with the street side remaining open to prevent conflicts with car doors. Other types of tree pit guards may be approved, provided that they are constructed of durable materials and do not interfere with the opening of car doors or the growth or maintenance of street trees.

General Planting Standards

Planting standards must be as outlined below or as specified by best practices in the industry. Any item or procedure not mentioned below may be as specified in the Landscape Specification Guidelines published by the Landscape Contractors Association (latest edition) or as subsequently amended. In addition to meeting the General Planting Standards described below, plantings on City properties and within City right-of-way must also meet the standards of the Green Book.

Size, Condition, & Quality

- Quality and size of plants, spread of roots, and size of root balls must be in accordance with ANLA standards.
- Bare root plants will be accepted only by special permission of the Department of Planning.

- Minimum tree and perennial sizes must be provided in accordance with the Planting Unit requirements as described in the Planting Requirements and Standards section of the Landscape Manual.
- Minimum shrub sizes must be provided in accordance with the requirements of the Project Site Conditions. Where a Project Site Condition does not specify a minimum shrub size, a minimum size of 18 to 24 inches shall be used.
- Major deciduous trees must have a clear trunk, free of branches, to a minimum height of 6 feet.
- Plants shall not have multiple leaders, unless this is the natural form; multi-stem trees are not acceptable for required street tree planting.
- Plants shall have been grown under climatic conditions similar to location of the project for at least two years before planting.
- Plants shall be high quality nursery grown. Plants shall be healthy and vigorous, typical of their species and variety; and have well-developed branches, densely foliated, and vigorous root systems.

Planting Seasons

To minimize the stress on newly installed plants and maximize their potential for survival, the following planting seasons shall be observed for the installation of landscaping:

	Deciduous		Evergreen	
Season	B&B	Container	B&B	Container
Spring	3/1 to 5/1	3/1 to 5/1	3/15 to 5/1	3/15 to 5/1
Fall	10/1 to 12/31	9/1 to 12/31	9/1 to 11/15	9/1 to 11/15

Planting outside these seasons within the public ROW or on City property requires permission from the City Arborist.

Installation

- Contact Miss Utility in advance of any digging.
- Dig planting pits and beds, amend soils, backfill planting areas, and install plants only when soil conditions are not wet, and when mixing and backfilling will not adversely affect soil structure.
- The plan preparer of the landscape plan shall include all standard details that apply to a given project as part of the landscape plan submission. Plants must be installed in accordance with the approved planting details.
- Do not handle, move, bind, tie, or otherwise treat plants so as to damage the root ball, roots, trunk, or branches in any way.
- All trees must be set so that the top one-eighth of the root ball sits above the finish grade. Plants shall rest on undisturbed existing soil or well-compacted backfill. Care shall be exercised in setting all plants vertical, and locating street trees in the center of tree pits.
- All trees must be staked or braced to provide stabilization during the period of establishment. When staking or bracing trees, use the simplest and least restrictive method required to provide stabilization in accordance with best practices of the industry.

All staking and bracing shall be completed the same day as planting and shall be removed after one year.

- Mulch shall be a natural product of 98% shredded bark and contain less than 2% wood or other debris, with no additives or other treatment. Mulch shall be applied to a uniform minimum depth of 3 inches and shall be so distributed as to create a smooth, level cover over the exposed soil, and should not be mounded at the bases of trees. A gap of approximately 3 inches must be left between the mulch and the trunk of the tree to avoid mounding above the trunk flare.
- Plants must be watered to the point of overflow or saturation twice within 48 hours of planting.
- Plant identification tags must be attached to plants, or staked within the planting bed until initial inspection by the plan preparer.

APPENDIX F: Soil Standards

Soil Composition

The quality of the soil and the overall design of a planting area are the foundations of successful landscaping, and vital to the long-term health of the plants. Plants require an adequate volume of topsoil which has the necessary nutrients, a minimum percentage of organic matter, and soil acidity in a defined range. The soil must be well drained and protected from compaction which prevents water and air from reaching the root zone of plants.

In many urban areas, the existing soil cannot provide trees and shrubs with sufficient nutrients and water penetration for their survival. In these cases existing soil needs to be improved or additional soil imported to supplement the existing site soil. Where plants are failing to thrive or for large or environmentally sensitive sites where importing soil is not an option, soil tests may indicate the most effective way to improve the soil.

The following soil standards apply to all proposed planting areas and shall be incorporated into the details and notes for all submitted landscape plans:

- Planting soils may be native soils, organically amended existing soil, or a topsoil blend mixed to achieve the requirements.
- Minimize compaction of planting areas during construction. Desired density range is 1.0 to 1.4 g/cc for topsoil and 1.2 to 1.5 g/cc for subsoil.
- Percolation testing and soil composition testing are required prior to installation of planting. Percolation rates of 1-2 inches (2.5-5 cm) per hour are preferred. Sub-drainage may be necessary in planting areas with insufficient percolation.
- Soil composition standards - amend existing soil as needed or provide a topsoil mix to achieve required ranges:
    - Mineral composition – 45-77% silt, 0-25% clay, 25-33% sand
    - Soil pH – pH 6.0-7.0
    - Organic content – 3-7%
    - Foreign material and stones over 2 inches in diameter are not permitted
- Amend soils and fertilize planting areas and tree pits as needed to remedy specific deficiencies revealed by a soil test. The use of compost or other natural nutrient sources and soil amendments is desirable to reduce the use of chemical fertilizers and impacts on water quality.

Soil Volume Standards

Trees require an adequate volume of quality soil to allow ample growing space for tree roots and canopy. In addition to the benefits for trees, adequate soil volumes also provide stormwater management benefits by providing better opportunity for infiltration for sites where soil contamination is not an issue. In urban areas, the ability to provide adequate soil volumes may be dependent on site-specific conditions such as sidewalk widths and the presence of utilities.

The following soil volume standards are required for all tree planting areas:

- Through the sizing of tree pits and planting areas and the use of structural alternatives as needed, provide a minimum soil volume of 144 cubic feet (minimum 48 square feet of soil area) per tree, or an ideal soil volume of 1 to 2 cubic feet of soil volume per square foot of mature tree canopy,
- Where feasible, planting areas shall have three feet minimum depth,
- Four feet minimum inside clear width; greater than six feet is desired where feasible, and
- To encourage extended zones of quality planting soil, planting areas shall be as long and as continuous as possible

Structural Alternatives for Achieving Adequate Soil Volumes

In highly urbanized areas, alternative means may be necessary to provide trees with adequate soil volumes. Soil volumes must be accessible to the tree roots to be considered part of the available soil volume. Structured rooting space must be able to accommodate surrounding utilities, support paving, and adequately support vehicle loading where necessary.

The following methods may be used or combined to achieve required soil volumes. Landscape plans must include notes and details clearly indicating the location and standards for construction of these techniques.

Suspended or Cantilevered Sidewalks

Suspended sidewalks create a grid-like support structure for sidewalks, consisting of columns and beams. The voids within the support structure provide space for soil volumes to support the growth of tree roots.

Structural Cells

Structural cells are modular, pre-engineered cell systems which support paved areas and provide space for utilities, while creating large areas of soil available for the growth of tree roots. These systems provide air space beneath the pavement which allows for irrigation, fertilization, and rainwater infiltration of the soil.

Soil Trenches

Soil trenches are trenches beneath the pavement, usually at least 5 feet wide, which provide additional soil volume for tree roots and allow them to extend toward adjacent tree pits and planting areas. Paving above soil trenches must be designed to span the width of the trench, with adequate support on either side of the trench.

Root Paths

Root paths are a method to guide roots out of confined planting spaces. Narrow 4-inch wide by 12-inch deep trenches are filled with strip drain board and loam topsoil. While they do not provide a significant soil volume, they may allow roots to grow under paved areas and connect to planting areas containing larger volumes of soil.

Tree Box Filters

Tree box filters are mini bio-retention areas installed as tree planting areas. Runoff is directed to the tree box, where it is cleaned by vegetation and soil before entering a catch basin. The runoff collected in the tree-boxes helps irrigate the trees.

APPENDIX G: Maintenance and Irrigation

Required landscaping must be kept alive and healthy to continue to meet the requirements of this manual and the Zoning Code. Proper maintenance and irrigation must be provided for all installed landscaping.

Maintenance

The maintenance of plants installed is required for successful landscaping. Plants cannot be installed and left alone, especially in urban environments where they may be subject to high temperatures, harsh environments, and physical abuse. Given the stresses and rigors to which plants are subjected, plants may require replacement. A one-year replacement warranty is required for all plants and a maintenance contract is encouraged to promote the establishment of plants and encourage proper landscape maintenance. Beyond the warranty period, the continued maintenance of the landscape is the responsibility of the property owner for the life of the project.

Requirements for landscape maintenance are as follows:

- Maintenance of landscaped areas includes, but is not limited to weeding, mulching, mowing, trimming, pruning, edging, cultivation, seeding, fertilization, watering, pest control, and any other maintenance necessary to ensure healthy, vigorous plant growth and well-kept property condition.
- Landscaping elements such as walls and fences shall be constructed in a sound workmanlike manner with adequate support or footings and must be repaired or replaced as needed to preserve an attractive appearance and to function as intended.
- Any dead plants or plants which fail to show healthy growth must be removed and replaced within 60 days of identification of deteriorated health or notification by the City. Replacement may be delayed until the next growing season only if the 60 day period occurs during a time of year not suitable for planting.
- All replacement plants must meet the size and other characteristics of newly planted material as required in the manual.
- Trees and large shrubs must be adequately supported, when necessary to insure proper growth. Tree staking must be removed prior to final inspection, with the exception of plants replaced during the warranty period and not yet established.
- It is desirable to avoid excessive use of fertilizers and pesticides to minimize impacts on water quality. It is recommended that fertilizer application be need-based rather than as an automatic component of maintenance schedules and when appropriate, slow-release or natural fertilizers be selected over highly-soluble chemical fertilizers.
- The implementation of an Integrated Pest Management (IPM) program is recommended to prevent and treat pest problems.

Irrigation

All plants need supplemental water during the first and second growing seasons to establish their root systems; however, a permanent irrigation system is not required. A general guideline for establishment is to provide irrigation at a rate of one inch of water per week, including that through rainfall. Recommended techniques to reduce water requirements and approved methods for the provision of water supply to plants include the following:

Design, Planning, & Maintenance

- Where feasible, site grading shall be designed to direct water into planting areas to reduce runoff and maximize the potential for infiltration, unless infiltration is undesirable due to contaminated soils.
- Where possible, group plants with similar water requirements and irrigate each area to meet these needs without over-watering.
- Reduce the use of lawn areas, which require greater amounts of water than drought-tolerant plant species.
- Maintain adequate mulch cover to reduce evaporation.

Irrigation Methods

- The use and maintenance of drip irrigation bags or rings around the trunks of newly-planted trees.
- Hand watering, with water sources provided through either or both of the following methods:
    - Exterior faucets on a building, located so that the farthest planting can be reached by a length of hose (100 feet recommended).
    - A quick-coupling system, with connections located so that the farthest planting can be reached by a length of hose (100 feet recommended).
    - A water tank or truck.
- An automatic irrigation system with a moisture-sensing device and/or rain shut-off switch. If using an automatic irrigation system, the following requirements shall be met:
    - All irrigation systems shall be designed to minimize vandalism.
    - Sprinklers must not over-spray onto pavement. Sprinkler and spray heads are not permitted for planting areas less than 8 feet in width, to prevent overspray and run-off. Other irrigation methods shall be specified in such areas.
    - Place lawn areas in a separate irrigation zone from shrub and groundcover beds, so that each planting type can receive adequate irrigation without over-watering areas with lower irrigation needs.
    - Drip irrigation is recommended for shrub and groundcover beds. Drip irrigation shall be used in areas smaller than five feet in any direction.
- The use of rainwater harvesting techniques combined with the use of harvested rainwater for landscape irrigation is encouraged.

APPENDIX H: Landscape Certifications

Plans or installation reports submitted by the plan preparer on behalf of the owner to certify the installation of all required landscape elements must contain a written certification that the landscape materials and elements have been installed in compliance with the approved Final Landscape Plan. The certification may be located on the plans or included in the installation report submitted to verify installation.

The certification for the Landscape Installation Inspection shall read as follows:

I certify that the installation of the approved Final Landscape Plan shown herein has been completed in a manner consistent with the goals and intent of and is in compliance with the requirements and standards of the Baltimore City Landscape Manual.

I also certify that the plants installed in accordance with the Final Landscape Plan shown herein are subject to a one-year replacement warranty to ensure establishment and maintenance of the landscaping and the replacement of dead or damaged plants.

_____	_____	_____
Name of Plan Preparer (print)	Phone Number	Email Address
_____	_____	_____
Signature of Plan Preparer	Date	MD License #

The certification for the Final Landscape Inspection shall read as follows:

I certify that the installation of the approved Final Landscape Plan shown herein has been completed in a manner consistent with the goals and intent of and is in compliance with the requirements and standards of the Baltimore City Landscape Manual.

I also certify that the installed landscaping has been maintained in a manner consistent with the requirements and standards of the Baltimore City Landscape Manual, including the replacement of dead or damaged plants.

_____	_____	_____
Name of Plan Preparer (print)	Phone Number	Email Address
_____	_____	_____
Signature of Plan Preparer	Date	MD License #

APPENDIX I: Existing Regulations, Approved Plans, and Reference Sources

The following regulations, plans, and guidelines have been referenced in this manual. The list below contains hyperlinks to each document, which may be accessed by clicking on the document's title when viewing this manual as a PDF file. Alternately, many of these documents can be found on the Department of Planning website:
http://planning.baltimorecity.gov/planning-resources

City-Wide Development Standards

Baltimore City Code
Baltimore City Zoning Code
Site Plan Review Guidelines
Baltimore City Development Guidebook
The City of Baltimore Standard Specifications 2006 (The Green Book)
Baltimore Department of Transportation Book of Standards

City & State Environmental Standards

The Baltimore Sustainability Plan
Maryland Stormwater Management Program
Maryland Stormwater Design Manual: Landscaping Guidance for Stormwater BMPs
Maryland Forest Conservation Act
Baltimore City Forest Conservation Program
Baltimore City Supplement to the State Forest Conservation Manual
Maryland Critical Area Regulations
Baltimore City Critical Area Management Program

Master Plans and Design Guidelines

Neighborhood Plans
Urban Renewal Plans
Other Planning Resources
Other Master Plans
Baltimore City Historic Preservation Design Guidelines
Downtown Streetscape Design Guidelines
Midtown Community Plan (Streetscape Guidelines)

APPENDIX J: Sustainable Landscape Resources

The purpose of this section is to provide a starting point for developers, designers, and residents interested in more information about planning, designing, constructing, and maintaining sustainable landscapes. The list below contains hyperlinks to relevant websites, which may be accessed by clicking on the list item when viewing this manual as a PDF file.

This section provides links to non-City of Baltimore web sites that provide additional information. The City of Baltimore cannot attest to the accuracy of information on a non-City of Baltimore website.

General Landscape & Sustainability Concepts

Sustainable Urban Development (American Society of Landscape Architects)
Green Infrastructure (American Society of Landscape Architects)
Combatting Climate Change (American Society of Landscape Architects)
Low Impact Development (Low Impact Development Center)
Sustainable Landscape Practices (University of Delaware Cooperative Extension)
Complete Streets (National Complete Streets Coalition)
Crime Prevention through Environmental Design (CPTED)

Plants & Planting Design

American Standard for Nursery Stock (American Nursery and Landscape Association)
Planting Guidelines & Specifications (International Society of Arboriculture)
Native Plant Guides for the Chesapeake Bay Watershed (U.S. Fish and Wildlife Service)
Recommended Native Plants for Maryland (University of Maryland Extension)
Invasive Species of the Mid-Atlantic (Mid-Atlantic Invasive Plant Council)
BayScapes: Conservation Landscaping (U.S. Fish and Wildlife Service)
GreenScapes: Environmentally Beneficial Landscaping (U.S. EPA)
WaterSense: Water Efficient Landscape Design (U.S. EPA)
Planting to Promote Wildlife Habitat (Maryland Department of Natural Resources)
Tree Space Design (Casey Trees)
Guidelines for Planting near Power Lines and Transformers (BG&E)

Landscape Materials & Elements

Sustainable Landscape Materials (University of Delaware Cooperative Extension)
Cool Pavements (U.S. Environmental Protection Agency)
Permeable Pavement (U.S. Environmental Protection Agency)

Stormwater Best Management Practices

Note: Stormwater BMPs must be designed and constructed in accordance with the Maryland
Stormwater Design Green Streets (U.S. Environmental Protection Agency)
Green Roofs (U.S. Environmental Protection Agency)
Rain Garden Design Templates (Low Impact Development Center)

Constructed Wetlands (U.S. Environmental Protection Agency)
Stormwater Planters (Charles River Watershed Association)
Tree Box Filters (Low Impact Design Center)
Rainwater Harvesting (AgriLife Extension Service)

Irrigation

Water Efficient Irrigation (Alliance for Water Efficiency)
Rainwater Harvesting for Landscape Use (U.S. Environmental Protection Agency)

Maintenance

Landscape Waste Reduction (CalRecycle)
Innovative Uses of Compost
(U.S. Environmental Protection Agency)Integrated Pest Management for Urban Landscapes
(IPM Practitioners Association)



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